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LEADING CHANGE: A PHENOMENOLOGICAL ANALYSIS OF PRINCIPALS'

EXPERIENCE IN A 1:1 COMPUTING INITIATIVE

by

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DISSERATION APPROVAL PAGE

This is to certify that the dissertation prepared by Stefani Pautz entitled Leading change:

A phenomenological analysis of principals' experience in a 1:1 computing initiative has

been approved by her committee as satisfactorily completing the dissertation

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ABSTRACT

One-to-one (1:1) computing initiatives, in which every learner is provided a personal computing device, have drawn researchers' attention for over 30 years. The field has not, however, explored principals' experiences leading the implementation of a 1:1 initiative. The purpose of this study was to build an understanding of principals' experience leading the changes associated with a 1:1 initiative and the contexts or situations that influenced those experiences. Using phenomenology, this study explored how eight elementary school principals leading a 1:1 initiative viewed their role and responsibilities, promoted change, and responded to successes and challenges. Data, collected through journals and semi-structured interviews, were analyzed using the Modified Van Kaam method. Findings revealed themes of fulfilling the responsibility of Optimizer, acting as a Change Agent, ensuring educational innovation in digital age learning, facilitating and participating in learning communities, and establishing and leveraging strategic partnerships. The analysis showed that collaboration permeates all aspects of change leadership in this context. Together, the composite themes and final synthesis provide insight into the collective experience and the underlying universal leadership structures. This research provides a lens through which leaders can reflect upon their own experiences leading 1:1 computing initiatives and provides the foundation for research that will direct the field in developing support and professional development for principals leading these initiatives.

Keywords: one-to-one computing, leadership, second-order change, phenomenology, K-12, technology

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CHAPTER I: INTRODUCTION

One-to-one (1:1) computing initiatives, in which every learner is provided a personal computing device, have seen rapid growth as school districts seek to equalize student access to technology and curriculum, and to equip students with the 21st century skills they will need to be competitive in a global economy. In 2011, Apple reported knowledge of more than 600 districts nationwide where at least one classroom had a 1:1 computer ratio (Associated Press, 2011). Since that time, programs have continued to grow in size and scale. Adding to this growth most recently is the implementation of the Common Core State Standards and the Partnership for Assessment of Readiness for College and Careers (PARCC) assessments, both of which require greater levels of technology access and expertise.

Implementing a 1:1 initiative requires a substantial investment. When implementing a large-scale 1:1 initiative, the costs of curriculum development, infrastructure, devices, support staffing, and professional development can reach more than $61 million dollars annually. In order to justify the expenditures, many program leaders look to research on 1:1 computing. While early research on 1:1 programs was criticized for its lack of student outcome data, unclear goals and novelty effects (Penuel, Kim, Michalchik, Lewis, Means, Murphy, Korbak, Whaley & Allen, 2002), more recent research has implemented improved research methodologies and illustrated positive student outcomes (Dunleavy & Heinecke, 2007; Lei & Zhao, 2008; Mouza, 2008; Penuel, 2006; Rosen and Beck-Hill, 2012).

From more general research on technology leadership, we know that the principal plays a vital role in the success of a technology initiative. The principals' leadership

directly impacts the teachers' technology integration (Chang, 2012). Successful

principals understand the leadership necessary to foster and support the changes

associated with technology initiatives (Afshari, Bakar, Luan, Fooi, and Samah, 2009;

Holt & Burkman, 2013; Levin & Schrum, 2013). In 1:1 computing research, however, the

role of the principal has received little attention and the research has not explored their

experience leading the implementation. Given the growing popularity of 1:1 initiatives

and the positive impacts of 1:1 computing for students, it is vital that we understand the

principals' experience leading change in this specific context. Furthermore, given the

large investments required, we cannot risk program failure because we do not understand

the experience of those charged with program leadership at the school level.

The purpose of this document is to present a dissertation study that builds an

understanding of principals' experience in leading the changes associated with a 1:1

initiative and the contexts or situations that influence those experiences. This document is

organized in five chapters, including the literature review, methodology, results, and

summary. The purpose of this chapter is to introduce the study. The chapter contains the

following sections: background, statement of the problem, purpose of the study,

significance of the study, research questions, research design, conceptual framework,

limitations, assumptions, definition of terms, and summary.

Background

In 1985, Apple Computers placed computers into classrooms with the goals of

fostering constructivist pedagogies, cooperative learning, and student initiative (Baker,

Gearhart, & Herman, 1990; Baker, Gearhart, & Herman, 1993). Research on the Apple

Classrooms of Tomorrow (ACOT) focused on teachers' change processes (Dwyer,

Ringstaff, & Sandholtz, n.d.; Ringstaff, Sandholtz, & Dwyer, 1991), teachers' collegial interactions (Sandholtz, Ringstaff, & Dwyer, 1991), impacts on classroom management (Sandholtz, Ringstaff & Dwyer, n.d.), and the impacts of student technology use (Reilly, n.d.; Baker, Gearhart, & Herman, 1993). What followed from ACOT was a body of research that emphasized student and teacher outcomes. Leaders of 1:1 initiatives who seek research on the role of the principal in building-level implementation will find few specific insights in the current body of 1:1 research, and must therefore look to research on technology leadership or change leadership. Research on technology leadership and change leadership provides important insights into the role and responsibilities of leaders, although not within the setting of 1:1 computing. This is problematic, as the change process is highly contextual (Fullan, 2007); it cannot be assumed that the leadership needed to effect change in a 1:1 computing initiative is the same as the leadership needed in other technology initiatives. This section will introduce the significant themes from research on 1:1 computing, technology leadership, and change leadership, and a conclusion posing questions that this literature leaves unanswered.

Implementation of 1:1 computing. Much of the research on 1:1 computing emphasizes student outcomes, an important area of focus to demonstrate the purpose and impact of the initiative. Recent research draws correlations between 1:1 computing and positive student outcomes in achievement (e.g. Dunleavy & Heinecke, 2007; Lei & Zhao, 2008; Lowther, Inan, Ross, & Strahl, 2012; Bebell & Kay, 2010), absenteeism and discipline (Rosen & Beck-Hill, 2012) and affective dimensions of learning (e.g. Lowther et al., 2012; Mouza, 2008). Research is also emerging that suggests that the skills and habits of mind developed in 1:1 computing programs during adolescence have a positive

impact in postsecondary and career success (Leger & Freiman, 2016). Moreover, because effective implementation is critical to positive student outcomes, recent research also emphasizes best practices for implementation, including the importance of learner-centered pedagogies (e.g. Dunleavy, Dexter & Heinecke, 2007; Lowther et al., 2012; Mouza, 2008), professional development (Claro, Nussbaum, Lopez, & Diaz, 2012; Storz & Hoffman, 2013), and fidelity of implementation (e.g. Bebell & Kay, 2010; Donovan, Green, & Hartley, 2010; Inserra & Short, 2012).

Limited research addresses the role of the principal in implementing a 1:1 initiative. Research suggests that the principal's role is important (Alberta Education, 2010; Greaves, Hayes, Wilson, Gielniak, & Peterson, 2012; Nash, 2009; Towndrow & Vallance, 2012), but fails to include the voices and experiences of those principals. A small body of research based upon personal narratives and single-perspective field observations is emerging which reflects the voice of leaders (Edwards, 2013; McLester, 2011; Nash, 2009); however, the field is lacking a more substantial body of scholarly research on 1:1 program leadership that describes the common experiences of principals engaged in the change process.

Technology leadership. Although research on the principal's role in 1:1 initiatives is limited, studies have examined the role of the principal as a technology leader. Effective technology leaders employ transformational leadership, where the leader inspires change through vision and motivation (e.g. Afshari et al., 2009; Afshari, Bakar, Luan, & Siraj, 2012; Seong & Ho, 2012). Effective technology leaders also employ distributed leadership, where leadership responsibilities are shared among the staff, to create the changes associated with a technology initiative (Levin & Schrum, 2013;

Petersen, 2014). Technology leaders communicate vision and mission (e.g. Banoglu, 2011; Chang, Chin, & Hsu, 2008; Eren & Kurt, 2011; Levin & Schrum, 2013); foster a school culture conductive to change (e.g. Levin & Schrum, 2013); focus on curriculum and instruction practices (e.g. Levin & Schrum, 2013); model and guide technology use (e.g. Cakir, 2012); intellectually stimulate and provide professional development (e.g. Chang et al., 2008; Chang, 2012; Cakir, 2012; Levin & Schrum, 2013); monitor and attend to individual teacher needs (e.g. Afshari et al., 2009); and include infrastructure, funding, and partnerships as part of technology plans (e.g. Banoglu, 2011; Levin & Schrum, 2013).

The research findings related to technology and leadership are consistent with the International Society for Technology in Education's Standards for Administrators (2012), which serve as a guide to transformational leadership for the digital age. The standards, referred to as the ISTE*A Standards, contain performance indicators for visionary leadership, developing a digital age learning culture, excellence in professional practice, systemic improvement, and digital citizenship (ISTE, 2012). School leaders implementing a 1:1 initiative use these standards and the findings from research in technology leadership to guide their practice; however, because the principals' experience in a 1:1 computing initiative has not been studied, it is unknown if the standards and findings can be generalized to that context.

Change leadership. Other research has examined the role of the principal as a change leader. While this research is not specific to technology implementation, it does provide useful insights into the change process and the principal's role. Change is a process through which innovations are adopted and schools culture is transformed

(Fullan, 2007). More specifically, change is a process of initiation, implementation, and institutionalization, and the principal leads change "on the ground" (Fullan, 2007, p. 156). To effect change, Fullan (2014) argues that principals must lead learning through professional capital, a three-part construct comprised of human, social, and decisional capital (Hargreaves & Fullan, 2012). Additionally, Fullan (2014) argues that principals lead change by fostering connectedness with other schools inside and outside of the system and by being a change agent.

Marzano, Waters, and McNulty (2005) also examined the role of the principal in leading change. Marzano et al. (2005) identified two types of change: first-order and second-order. First-order change is defined as change that is incremental and consistent with current values and norms (Marzano et al., 2005). Second-order change is defined as change that is innovation-driven and irreversible, requiring dramatic departures from the past (Marzano et al., 2005). For example, changing a school's bell schedule is a first-order change. It is consistent with current norms for how students are grouped throughout the school day. In contrast, creating proficiency-based classrooms not based on age is an example of second-order change. It is driven by the innovative idea that students can move through content at their own pace, and requires a dramatic departure from how students have traditionally been grouped. In a 1:1 initiative, when a culture of teacher-centered instruction is prevalent, the shift to 1:1 computing and learner-centered pedagogies is a second-order change. It is driven by the innovation made possible by ubiquitous computing and requires a dramatic departure from past pedagogies. Marzano et al. (2005) identified seven leadership responsibilities highly correlated with second order change, which include: Change Agent; Flexibility; Ideals and Beliefs; Intellectual

Stimulation; Knowledge of Curriculum, Instruction, and Assessment; Monitor and Evaluate; and Optimizer. According to Marzano et al. (2005), when principals focus on these responsibilities, second-order change initiatives are more likely to succeed.

Both Fullan (2007) and Marzano et al. (2005) are recognized leaders in the field, and their research on change leadership provides important insights into the role of the principal in leading a 1:1 initiative. However, current research on 1:1 computing initiatives does not apply these change leadership concepts to the principals responsible for leading the change. Research is needed to determine if these concepts are generalizable to this context.

Conclusion. Current research on 1:1 computing provides evidence of the positive impacts on students (Bebell & Kay, 2010; Dunleavy & Heinecke, 2007; Lei & Zhao, 2008; Lowther et al., 2012; Rosen & Beck-Hill, 2012) and the implementation practices that will yield those results (Bebell & Kay, 2009, 2010; Claro et al., 2012; Dunleavy et al., 2007; Donovan et al., 2010; Inserra & Short, 2012; Lowther et al., 2012; Rosen & Beck-Hill, 2012; Storz & Hoffman, 2013). This research also suggests that the principal's role is important (Alberta Education, 2010; Greaves et al., 2012; Nash, 2009; Towndrow & Vallance, 2012), but it lacks their voices and experiences. Research in technology leadership and change leadership emphasize the importance of the principal's role in successful program implementation (Cakir, 2012; Chang, 2012; Chang et al., 2008; Eren & Kurt, 2011; Fullan, 2007; Fullan, 2014; Levin & Schrum, 2013; Marzano et al., 2005), but is not specific to the context of 1:1 computing.

Based upon current knowledge and theories about effective principalship and school-based leadership alongside the growing move to 1:1 computing across the nation

and the gaps exposed in the existing research, we must ask: How does a principal lead change in a 1:1 computing initiative? Can we assume that all technology leadership is the same? How does current change leadership research apply in the context of 1:1 computing? The leadership of an initiative can be the difference between its success and failure; therefore, we cannot continue to move forward in pursuing 1:1 initiatives without understanding the experience of the principal. An understanding of principals' experience is essential in maximizing leadership effectiveness, and in turn, program effectiveness.

Statement of the Problem

The field is lacking in its understating of how change leadership is experienced by principals in the context of a 1:1 initiative. Research on program implementation from the teacher and student perspective is prolific (Dunleavy et al., 2007; Lowther et al., 2012; Prettyman, Ward, Jauk, & Awad, 2012; Spires, Oliver & Corn, 2011), and includes qualitative methods that describe their experiences (Garthwait & Weller, 2005; Storz & Hoffman, 2013). However, to date, the literature does not reflect the lived experience of principals leading change in a 1:1 initiative.

This lack of empirical research is problematic for two reasons. First, because we lack an understanding of this experience, program leaders are forced to make assumptions and generalize technology leadership and change leadership research that is not contextualized in a 1:1 initiative. These assumptions drive professional development and the design of support systems for principals. Program decisions are being made without truly understanding the lived experience in this context.

Second, without understanding the lived experience, we cannot appropriately transfer current knowledge of effective change leadership to this context. Effective

leadership is critical due to the second-order nature of the change (Marzano et al., 2005). In contrast to first-order technology initiatives that provide tools without significant changes to the instructional model, the most effective 1:1 initiatives create learner-centered environments where technology is used to empower students as leaders of their own learning and to provide experiences that would not be possible otherwise (e.g. Fullan, 2013; Levin & Schrum, 2013; Rosen & Beck-Hill, 2012). Leading second-order change is a key responsibility of principals (Marzano et al., 2005), yet we do not have an understanding of how principals view their roles and responsibilities leading second-order change in this context. We must first understand the nuances of the lived experience in leading 1:1 initiatives before transferring claims regarding effective program leadership.

According to Fullan (2007), many change initiatives collapse because of a failure to understand the lived experience of those involved. Further, Marzano et al. (2005) suggest that second-order change initiatives are particularly challenging to lead, and are more likely to fail when leadership actions are not aligned to the magnitude of the change. Research has revealed the benefits of 1:1 computing, and attempts at adoption have increased nationwide. We cannot risk failure in these initiatives because we fail to understand the experience, including the perceived roles and responsibilities, of those charged with leadership at the school level. We must have insight into the experiences of principals leading these changes; this knowledge will guide us in understanding how to implement 1:1 computing.

Purpose of the Study

To ensure effective leadership in 1:1 initiatives, and thereby the probability of

success, we must gain an understanding of how principals view their role and responsibilities, how they promote change, and how they respond to successes and challenges. The lack of scholarly research that describes the experiences of principals leading change in a 1:1 initiative must be addressed. Without this fundamental understanding, we are unable to make research-based decisions regarding leadership in program implementation. Therefore, the purpose of this study is to build an understanding of principals' experience in leading the changes associated with a 1:1 initiative and the contexts or situations that influence those experiences. This study explores the beliefs, attitudes, and needs of school principals in order to derive an essence of what it means to lead change in these environments. By focusing on the principals' collective experience, this study uncovers the phenomenon of change leadership in a 1:1 initiative. The outcomes of this inquiry provide both a lens through which to reflect upon current practices, as well as a foundation for future research pursuing changes in the field that will maximize program effectiveness.

Significance of the Study

This study is significant for its contribution to the research and literature on both 1:1 computing and change leadership. The study addresses the lack of scholarly research on 1:1 program leadership that describes the common experiences of leaders engaged in the change process. It brings the voices of principals into the research at a time when the field is striving to build leaders who not only understand the potential of instructional technology, but also how to positively affect its use and create lasting change. The study also makes connections between established research on leading second-order change and

the new context of 1:1 computing, thereby providing new insight into the change process in this specific context.

Additionally, the results of this study, the outcomes and implications that come from understanding common experience, provide a lens through which readers can reflect upon their own experiences leading 1:1 computing initiatives and inform professional decisions about program implementation and the adoption of 1:1 technologies in public schools. Because this understanding has, so far, been lacking, program leaders have had to assume what the experience is and provide supports without truly understanding the beliefs, attitudes, or needs of principals in this context. By providing insight into the lived experience of principals leading 1:1 initiatives, this study provides a foundation for future research that will lead to pursuing changes in the field. More specifically, this study provides the basis for research that will direct the field in planning and providing relevant support and professional development, which are keys to effective program implementation.

Research Questions

This research addresses limitations in our understanding of change leadership in 1:1 computing initiatives by building an understanding of principals' lived experience. Revealing the essence of change leadership in this setting has implications for leadership effectiveness and program success by providing a lens through which to reflect upon current practices and a foundation for future research pursuing changes in the field regarding support and professional development for leaders.

To explore the phenomenon of change leadership in a 1:1 initiative, one central question and several focused sub-questions guided this research. The central question driving this study was:

- What is the experience of principals leading change in a 1:1 computing initiative?

Three sub-questions clarified the intent of the investigation by defining the meaning of "experience" in this study. The sub-questions were:

- How do principals view their role and responsibilities in leading change in a 1:1 initiative?

- How do principals promote change in their schools in a 1:1 initiative? and

- How do principals' respond to successes and challenges in a 1:1 initiative?

Research Design

A phenomenological research design was used to understand and describe the essential experience for principals leading the changes associated with a 1:1 initiative. Phenomenology provides both a philosophy and methodology for understanding and describing lived experience from the perspectives of those experiencing it (Moustakas, 1994). Operating under the assumption that there are commonalties in experience, phenomenology aims to understand and describe the essence of the experience. Unlike other qualitative methodologies, phenomenology goes beyond in-depth description and analysis of a case to synthesize the shared experiences and describe the essence of the experience.

The large Mid-Atlantic school district that provided the setting for the study was, at the time of this research, in the early implementation phases of a system-wide

transformation of teaching and learning. When fully implemented, the district will be one of the largest-scale 1:1 computing initiatives in the country. The school system identified a small group of elementary schools to pilot device implementation and instructional changes before implementing the program in all elementary schools. The schools reflected the district's geographic and socioeconomic diversity. The eight principals participating in this study were all leaders of schools piloting the 1:1 initiative. By engaging in phenomenological research with these principals, their lived experience was described and synthesized, resulting in an essential description of the shared experience.

Data used for this study comes from journals and interviews. The principals recorded their experiences in journals, which were collected during the first eight months of program implementation. These journals asked participants to consider change, technology, and pedagogy (Fullan, 2013) when reflecting on their experiences. The use of journaling enabled an ongoing, real-time reflection throughout the experience and informed the creation of an interview protocol. The journaling experience was followed by semi-structured interviews. The journals and interviews were combined for data analysis, which enabled an understanding of the principals' experience leading change in a 1:1 computing initiative.

Conceptual Framework

To frame this study, a contemporary conceptual framework was needed that could capture the complexity of a leading change in a 1:1 initiative. Therefore, Fullan's (2013) Stratosphere was identified as the conceptual framework for this research. Stratosphere represents the interconnectedness of technology, pedagogy, and change knowledge, and the convergence of those forces to transform education (Fullan, 2013). The synchrony of

pedagogy, technology, and change knowledge transforms classrooms by engaging students in ubiquitous computing, authentic learning, and learner-centered instruction, which in turn will increase student learning in a way that is meaningful beyond the classroom (Fullan, 2013).

Fullan (2013) argued that new learning environments must be "i) irresistibly engaging (for students and for teachers); ii) elegantly efficient and easy to use; iii) technologically ubiquitous 24/7; and iv) steeped in real-life problem solving" (p. 4). Pedagogy is paramount, and is characterized by the clarity and quality of the intended learning outcomes, the innovativeness of the pedagogy itself, and the quality of assessment platform (Fullan & Donnelly, 2013). These "new pedagogies" (Fullan & Langworthy, 2014, i) make students and teachers equal partners in learning and emphasize the importance of mastering the learning process (Fullan, 2013; Fullan & Langworthy, 2014). Ubiquitous technology enables new pedagogies by expanding time and space for learning and facilitating collaboration (Fullan, 2013; Fullan & Langworthy, 2014). Access to digital tools and resources enables learners to be both producers and consumers, connecting their learning to the world outside the classroom (Fullan, 2013; Fullan & Langworthy, 2014).

These new pedagogies cannot impact learning on a large scale unless system change knowledge is applied (Fullan, 2013). Leaders focused on whole system change (Fullan, & Donnelly, 2013) provide focus and vision, are empathetic and transparent, and eliminate non-essentials (Fullan, 2013; Fullan & Langworthy, 2014). Most importantly, leaders focus on developing a culture of learning (Fullan, 2013; Fullan & Langworthy, 2014). They become learning partners, building and establishing collaborative and risk-

taking cultures, and using professional learning and evaluations to build capacity (Fullan & Langworthy, 2014). Change is neither top down, nor bottom up, but is organic and comes from all levels of the organization (Fullan & Langworthy, 2014). All stakeholders are change agents, motivated by intrinsically meaningful and collaborative work (Fullan & Langworthy, 2014).

To ground this conceptual framework in research and the field, an analysis was conducted to align the leadership responsibilities for second-order change identified by Marzano et al. (2005) and the ISTE*A (2012) performance indicators with stratosphere. The analysis revealed that each leadership responsibility and performance indicator aligned to pedagogy, technology, and/or change knowledge. While the responsibilities for second order change identified by Marzano et al. (2005) are not specific to technology and the ISTE*A standards are not specific to second-order change, together the responsibilities and the standards reflect all three facets of stratosphere. Stratosphere is the only current framework that reflects both the technological and pedagogical components of a 1:1 initiative, as well as the change knowledge necessary for such programs' success. Stratosphere served as the basis for the journal prompts used in initial reflection by the study's participants. Stratosphere also provided the foundation for the phenomenological data analysis of the participant interviews, which were the primary data sources.

Limitations

The setting was a large Mid-Atlantic school district in the early implementation stages of a five-year plan for a system-wide instructional digital conversion. The digital conversion represents a fundamental shift in teaching and learning, with the goal of

graduating globally competitive students equipped with 21st century skills. To this end, all students will have access to a mobile digital learning device and a personalized, blended, interactive curriculum. Although this setting was selected because of convenience, access, and an opportunity to impact the field, it is significant and worthy of study as one of the largest-scale 1:1 computing initiatives in the country. The participants in this study were the ten elementary school principals leading the school system's pilot for the 1:1 initiative. Convenience sampling was used to identify the participants. The school system identified ten schools to pilot device implementation and instructional changes. Given this focused sample and the setting, the results may not be generalizable to a broader group.

The study is further bound by the time of the study. Because the focus is initial implementation, data was collected only within the first year of the initiative. Data collection began when principals were receiving professional development to prepare them for implementation, and lasted through the first school year. Because this study examines leadership only during the initial implementation stage, results may not apply at later stages of implementation.

Assumptions

This study is built upon two key assumptions. First, in embracing a phenomenological philosophy and methodology, the researcher assumes that there are commonalities in human experiences, and that those shared experiences have an essence or core meaning (Merriam, 2009). Second, the researcher assumes the credibility of her participants. This includes their honesty in providing data through journal writing and

interviews and their fidelity in implementing the 1:1 program. The results of this study are dependent upon these assumptions.

Definition of Terms

The following terms are defined in relation to this study. Definitions are synthesized from current research and informed by the researcher's knowledge of the field.

- One-to-one (1:1) computing: learning environments where every learner is provided a personal computing device. Key concepts: ubiquitous, mobile

- Technology: The use of digital content and digital tools to enhance learning (e.g. ISTE, 2012; Fullan, 2013). Key concepts: ubiquitous access, tools for collaboration, "ever expanding storehouses of information" (Fullan, 2013).

- Change: The process through which innovations are adopted and schools are recultured. Key concepts: initiation, implementation, institutionalization, cognitive and affective change (e.g. Bridges, 2003; Fullan, 2007; Fullan 2013; Marzano et al., 2005; Rogers, 2003)

  o First-Order Change: Change that is incremental and consistent with current values and norms (Marzano et al., 2005)

  o Second-Order Change: Change that is innovation-driven and irreversible, requiring dramatic departures from the past (Marzano et al., 2005)

- Instructional Leadership: The role of the principal in guiding and supporting instructional practices in the building in order to develop more skilled practice. This includes, but is not limited to, providing resources, making instructional concerns a priority, observing teachers, assisting teachers, managing curriculum and instruction,

facilitating collaboration, and using research to drive decision-making (Marzano et al., 2005).

- Pedagogy: "The art and science of teaching" (Marzano, 2007).

  o Learner-centered pedagogies: Methodologies that empower students to take primary ownership of authentic problems and "what, when, and how learning will occur" (Hannafin, 1992/2001). Key concepts: opportunities to learn differently, learning how to learn, students and teachers as partners in learning (Fullan & Langworthy, 2014).

- Phenomenology: A philosophy and methodology for qualitative research with emphasis on understanding human experience and consciousness without presuppositions (Moustakas, 1994).

  o Epoche: The first step in phenomenological data analysis, wherein the researcher makes a conscious effort to clear his or her mind of all preconceived notions and biases so that descriptions of experiences can be viewed purely as phenomenon (Moustakas, 1994).

  o Essence: The fundamental meaning of a common experience, reflective of the synthesis of what is experienced and how (Moustakas, 1994).

Summary

As the number of 1:1 computing initiatives continues to rise, the body of research on the subject has continued to expand. Research on program implementation from the teacher and student perspective is prolific (Dunleavy et al., 2007; Lowther et al., 2012; Prettyman et al., 2012; Spires et al., 2011; Storz & Hoffman, 2013), however, the current literature on the subject does not reflect the lived experience of principals leading change

in a 1:1 initiative. An understanding of this lived experience is critical to the success of change efforts (Fullan, 2007).

This study builds an understanding of principals' experiences in leading the changes associated with a 1:1 computing initiative and the contexts or situations that influence those experiences. Using a phenomenological method, this study explores the beliefs, attitudes, and needs of school principals in order to derive an essence of what it means to lead change. Through this method, this study provides detailed descriptions of the subjective experiences of principals leading change in this context, and synthesizes the shared experiences to identify collective qualities and meanings.

This study is significant for its contribution to the body of scholarly research on 1:1 computing and change leadership. It fills a gap in research on the principals' experience and makes connections between established change and leadership research and the new context of 1:1 computing. The results of this study also provide a lens through which readers can reflect upon their own experiences leading 1:1 computing initiatives and inform professional decisions about program implementation and the adoption of 1:1 technologies in public schools. This study will direct program leaders in planning and providing relevant support and professional development, which is a key to effective program implementation.

CHAPTER II: LITERATURE REVIEW

Schools have a moral imperative to prepare their students for a future in an increasingly competitive global marketplace. As schools seek new and innovative ways to teach core knowledge and 21st century skills, an increasing number are looking to 1:1 computing as a promising means to meet learner needs. Research on instructional technology and 1:1 computing in schools has a significant history, and leaders of 1:1 programs look to this research for positive impacts on learning that can justify the investment to stakeholders, as well as best practices for implementing the changes associated with 1:1 learning environments.

Since the mid-1980s, researchers have examined the strategies schools use for pursuing a 1:1 learning environment, the significant changes required to implement 1:1 computing, and the impacts of 1:1 computing on student learning (e.g. Baker, Gearhart, & Herman, 1990; Dwyer, 1994; Richardson, McLeod, Flora, Sauers, Kannan, & Sincar, 2013; Tierney, 1988). However, only recently has there been a focus on the role of leadership, a key aspect of implementation, within 1:1 environments (e.g. Greaves, Hayes, Wilson, Gielniak, & Peterson, 2012; Nash, 2009; Towndrow & Vallance, 2012). The literature has not yet explored the phenomenon of principal leadership and their role in driving the change within the school environment. Research on technology leadership and change leadership does illustrate the role of the principal in leading change, but that research is not contextualized within 1:1 computing.

This literature review presents a history of research on 1:1 computing, technology leadership, and change leadership, illustrating the conceptual and methodological gaps in the literature that this study addresses. Additionally, this literature review will examine

change theory, identifying how this study contributes new insights through an exploration of the phenomenon of leading change in 1:1 learning environments. This chapter consists of the following sections: one-to-one computing, technology leadership, change leadership, and change theory.

One-to-One Computing

One of the earliest researched 1:1 computing programs in the United States was the Apple Classrooms of Tomorrow (ACOT). Beginning in 1985, ACOT provided students and teachers with computers to use both at school and at home. ACOT believed that technology could support constructivist pedagogies (Baker et al., 1990) and encouraged teachers to use the computers in ways that facilitated cooperative learning, student initiative, and cognitive processing (Baker, Gearhart, & Herman, 1993; Dwyer, 1994; Tierney, 1988). The multi-year program evaluation examined teachers' change processes (Dwyer, Ringstaff, & Sandholtz, n.d.; Ringstaff, Sandholtz, & Dwyer, 1991) and collegial interactions (Sandholtz, Ringstaff, & Dwyer, 1991), as well as impacts on classroom management (Sandholtz, Ringstaff & Dwyer, n.d.) and student technology use (Reilly, n.d.; Baker, Gearhart, & Herman, 1993).

Since ACOTs inception, 1:1 computing has seen a steady increase in popularity. According to a 2010 survey from the National School Boards Association, 37% of districts in the United States had implemented a 1:1 computing program at some scale (Nagel, 2010). States with districts implementing 1:1 computing include South Dakota, Pennsylvania, New Hampshire, Texas, Georgia, Louisiana, California, Virginia, Florida, Kansas, Maine, Massachusetts, Michigan (Bebell & Kay, 2010), North Carolina, and Maryland. Programs have also continued to expand internationally. A database of large-

scale 1:1 computing initiatives created by Richardson et al. (2013) indicates it is present on every continent, with South America currently reporting the largest number of programs.

The growth of 1:1 computing initiatives, however, is not a result of solid research foundations that demonstrate consistently positive student outcomes. The field is plagued by a history of limited and insubstantial research (Bebell & Kay, 2010; Mouza, 2008; Penuel, Kim, Michalchik, Lewis, Means, Murphy, Korbak, Whaley & Allen, 2002; Penuel 2006; Rosen & Beck-Hill, 2012; Richardson, et. al, 2013). Early research on the subject aimed to illustrate program effectiveness. Only a limited number of studies, however, did so by analyzing student outcomes. In a synthesis of the research, Penuel et al. (2002) found only 19 studies that analyzed outcomes. Penuel et al. (2002) further asserted that the research methodologies in those studies were weak, failing to control for variables and making it impossible to conclude that the technology use was directly affecting the outcome. Penuel's criticisms echoed Clark's (1983/2001) criticisms of instructional technology research methodologies two decades earlier. Clark claimed that as a whole, research methods failed to control for confounding factors, such as novelty effects for new media, and differences between treatment groups in instruction and content.

Between 2001 and 2006, the field responded to these limitations with a body of outcome-driven research. Penuel (2006) analyzed this new research and identified 46 studies that examined outcomes, noting that findings were emerging that correlated technology use and achievement. This new body of outcome-driven studies also reflected an emerging emphasis on the teacher and program implementation. Two themes

emerged: how teacher attitudes and beliefs shape implementation and the role of professional development and technical support in fostering implementation (Penuel, 2006). Penuel (2006) concluded that research on 1:1 program implementation was consistent with research on other technology innovation implementation, and noted a particular importance of peer-to-peer interaction and support for teachers.

Even with changes in research methods, some critics in the field were still dissatisfied. Cuban (2006) wrote, "Officials mistake the medium of instruction for how teachers teach. Personal computers [...] are only vehicles for transporting instructional methods; machines are not what teachers do in classrooms" (n.p.). While Penuel (2006) wrote in support of 1:1 computing, he remained cautious about drawing conclusions regarding student and teacher outcomes. He cited limitations in research methodologies, such as reliance on self-report data and instruments with questionable reliability and validity as ongoing concerns. Cuban (2006) indicated similar limitations as well as false reports from quasi-experimental studies that do not isolate the variables. Research from 2006 to the present responds to many of the criticisms of past research, exploring outcomes and implementation (e.g. Dunleavy & Heinecke, 2007; Mouza, 2008; Rosen & Beck-Hill, 2012; Levin & Schrum, 2013).

Outcome-driven research. Research from 2006 to the present continues to place a heavy emphasis on student and teacher outcomes, and shows correlations between 1:1 computing and improved student outcomes in a variety of settings. In one example, Dunleavy and Heinecke (2007) employed a quasi-experimental design to compare achievement between students in the same school, those with 1:1 and those without. Dunleavy and Heinecke (2007) found significant effects for science achievement with at-

risk middle school students, and a particularly strong effect for boys. Using pre-post survey instruments, Lei and Zhao (2008) found significant gains for middle- and upper-class middle school students in technology proficiency and marginally significant gains in student achievement as measured by GPA. Downes and Bishop (2015) also studied 1:1 implementation in middle schools, and found intersections between 1:1 computing and research-based characteristics of effective middle schools such as team building, and authentic learning. Mouza (2008) examined outcomes for low income, minority students in the primary grades using a quasi-experimental mixed methods design. Mouza (2008) found positive impacts on motivation, persistence, student initiative, and collaboration, as well as academic gains in reading and writing. These findings are reinforced by Sung, Chang, and Liu's (2016) meta-analysis of research on the impact of mobile devices, including laptops. Sung, et al. (2016) found that learning with mobile technology is significantly more effective than "pen-and-paper" or desktop computer instruction, with a moderate mean effect size of .523.

Positive outcomes were also seen in large-scale initiatives. Bebell and Kay (2009, 2010) examined the Berkshire Wireless Learning Initiative as implemented in five schools over three years, and reported measurable changes in teacher practice and student achievement, engagement, and research skills. These causations were established based on multiple data points, including surveys, interviews, and quantitative assessment data. Lowther, Inan, Ross, and Strahl (2012) used a mixed-methods descriptive and quasi-experimental design with validated observation and survey instruments in research on Michigan's Freedom to Learn initiative. Results from this work indicated that classrooms with 1:1 computing reflect more student-centered instruction and more teacher self-

efficacy in technology integration (Lowther et al., 2012). Lastly, Rosen and Beck-Hill (2012) found that the Grand Prairie Independent School District's Time to Know 1:1 program positively impacted student learning, absenteeism rates, and student discipline. These studies provided a more valid and reliable research basis for claims about the benefits of 1:1 computing. Little was still known, however, about how program leadership could impact those results.

Implementation studies. Research from 2006 to the present added the exploration of factors for effective implementation to the body of research on 1:1 computing. This research began to explore the characteristics of effective implementation and identify factors that contribute to program success. Three themes for effective implementation emerged from the research: 1) Effective 1:1 environments implement learner-centered pedagogies and integrate technology into the curriculum in ways that redefine learning tasks, 2) professional development impacts implementation, and 3) fidelity of implementation is a variable in implementation success.

Learner-centered instruction and technology use. Research on 1:1 computing found that classroom instruction built upon established learner-centered models of instruction (e.g. Mouza, 2008; Lowther et al., 2012). Researchers have long advocated the benefits of constructivist and constructionist learning, where the teacher's role is to develop authentic scenarios and problems for students to grapple with, and to support students in learning through identification of materials and ongoing scaffolding (Jonassen, 1991/2001; Hannafin, 1992/2001; Land, Hannafin & Oliver, 2012; Papert & Harel, 1991). In learner-centered classrooms, students take primary ownership of "what, when, and how learning will occur" (Hannafin, 1992/2001); this results in increased

motivation, an improved ability to evaluate varied perspectives and ideas while continually reorganizing their schema, and a greater preparation for the complex, ill-structured problems students will encounter in the real world (Bransford, Brown, & Cocking, 2000; Land et al. 2012). Fullan & Langworthy (2014) applied these principles of student-centered learning in what they termed "new pedagogies," which combine new learning partnerships, new learning tasks, and ubiquitous access to digital tools and resources. In these new pedagogies, teachers go beyond facilitation, a hallmark of student-centered learning, to become co-learners with students. Students create new knowledge, use that knowledge in authentic contexts, and use digital tools and resources for content discovery, local and global collaboration and knowledge creation.

Research on 1:1 computing examines how technology is used to enhance the learner- centered instructional models described by leaders in the field (e.g. Jonassen, 1991/2001; Hannafin, 1992/2001; Fullan & Langworthy, 2014). Mouza (2008) found that technology in 1:1 classrooms was used to facilitate project-based learning, collaboration, and sharing with public audiences. Teachers served as facilitators and students had choice in how they reached curricular goals. In contrast, the comparison group had computer access, although not 1:1, and used the technology primarily for word processing and often as a reward. The 1:1 classroom yielded more positive student outcomes. Prettyman et al. (2012) uncovered similar findings in their study of 1:1 computing in middle school Science, Technology, Engineering, and Math (STEM) programs employing problem-based learning. Students unanimously stated that their learning experience was improved in the 1:1 program; this was attributed to their engagement in knowledge construction and creation. Technology was used to remove learning barriers of time and space,

enabling students to interact with the world outside of school and develop 21st century skills.

The evaluations of the aforementioned Michigan Freedom to Learn initiative (Lowther et al., 2012) and Grand Prairie Independent School District's Time to Know program (Rosen & Beck-Hill, 2012), also support implementation trends using learner-centered pedagogies. Lowther et al. (2012) found significant differences in the use of independent inquiry and research, as well as project based learning. These pedagogies were supported by more "meaningful" uses of technology, such as information processing and manipulation to solve problems, rather than "low level" uses such as drill and practice (Lowther et al., 2012). Rosen and Beck-Hill (2012) found that 1:1 classrooms in the constructivist program exhibited more independent learning, intellectual challenge, and instructional adjustment than the non-1:1 comparison group.

The application of learner-centered pedagogies in 1:1 computing initiatives illustrates that technology is not an end in itself. Dunleavy et al. (2007) argued, "It is really not about the laptops. It is about what the laptops enable in terms of new ways of teaching and learning" (p. 451). To guide school leaders in implementing learner-centered pedagogies with technology, Levin and Schrum (2013) emphasized that curriculum and instruction practices must be addressed simultaneously with vision, leadership, school culture, technology planning and support, professional development, funding, and partnerships. Levin and Schrum (2013) do not, however, specifically explore the principals' role in addressing those topics.

Professional development. Research also suggests that professional development is a critical component in successful implementation. For example, Claro, Nussbaum,

López and Díaz (2012) examined a large-scale 1:1 program in Chile for outcomes related to innovative pedagogy. Claro et al. (2012) found sporadic use of the technologies, and correlated limited use with the lack of professional development, technical support, and pedagogical support prior to and during implementation. Storz and Hoffman (2013) used a phenomenological method to examine teacher and student experiences in implementing 1:1 computing in an urban middle school. Storz and Hoffman (2013) found that both teachers and students perceived the program as potentially beneficial, but that teachers perceived professional development as both critical and lacking. These studies suggest that an emphasis on professional learning has a positive influence, whereas a lack of professional learning is a barrier to implementation.

Fidelity of implementation. Research in implementation also examines fidelity of implementation as a variable. In Dunleavy, Dexter and Heinecke's (2007) case study of two middle schools, researchers found that teachers' variations in implementation reinforced certain classroom cultures and norms, such as collaboration vs. competition and inquiry vs. direct instruction. For example, in one classroom, students were allowed to use the breadth of the Internet for research while in another they were restricted to sites pre-determined by the teacher. Recommendations from the study included the articulation of clear program objectives for effective technology use. Bebell and Kay's (2009, 2010) evaluation of the Berkshire Wireless Learning Initiative suggested that the teacher played a critical role in the program's success, as they are responsible for determining when and how technology will be used. Bebell and Kay (2009, 2010) found variances in technology use between subjects and grade levels within schools as well as between schools.

Donovan, Green, & Hartley (2010) supported these findings in their examination of the different ways a 1:1 program can be implemented in a single middle school. Three different innovation configurations were found, indicating variability in fidelity of implementation. One innovation configuration was characterized by off-task behavior; this led to the finding that increased technology use and increased engagement are not always correlated. Inserra and Short (2012) examined the implementation of pedagogy in 1:1 computing environments. The research revealed that math, science, social studies, English, and foreign language teachers differed in their implementation of collaborative learning, constructivist learning, project-based learning, and differentiated instruction in the 1:1 environment (Inserra & Short, 2012).

Moreover, fidelity of implementation has real impacts on student outcomes. Project RED sets forth key implementation factors for 1:1 programs, including the integration of technology into core subjects and interventions and the use of technology for formative assessment, collaboration, virtual field trips, and research (Greaves et al., 2012). Greaves et al. (2012) reported that research on 997 schools across 49 states and the District of Columbia revealed that 1:1 schools consistently implementing Project RED's key implementation factors outperformed those that did not. For example, properly implemented 1:1 schools showed a 92% reduction in dropout rate in contrast to a 65% reduction for all 1:1 schools. Similarly, properly implemented 1:1 schools showed a 90% increase in high stakes test scores in contrast to a 70% increase for all 1:1 schools.

Many of the "best practices" for 1:1 programs come from this emerging body of research on effective implementation. In my own experience, I have observed 1:1 program implementation emphasizing professional development at all levels of the

organization, from central office staff to principals to teachers. This is consistent with the conclusions of Claro et al. (2012) and Storz and Hoffman (2013) that professional development was vital to the successful implementation of 1:1 computing. I have also observed principals' professional development supporting fidelity of implementation through co-construction of meaning related to student-centered learning and effective technology use, in line with Dunleavy et al. (2007), Donovan et al., (2010), Inserra and Short (2012) and Greaves et al. (2012). While my examples from the field illustrate how research is informing program implementation, we lack an understanding of how principals perceive their role within it. Research that describes principals' experience leading the changes associated with a 1:1 initiative is necessary; it will enable us to reflect upon our current practices and will lead to the development of professional learning experiences that will ensure success.

  Leadership. The historical body of research on 1:1 computing further illustrates the complexity of implementing a 1:1 computing initiative (e.g. Bebell & Kay, 2010; Claro et al., 2012; Levin and Schrum, 2013; Weston & Bain, 2010) and while recent research on implementation (e.g. Greaves et al., 2012; Storz & Hoffman, 2013) has addressed what was a significant conceptual gap in the literature, research on the role of the leader in that implementation is still limited. In the literature prior to 2006, the role of the principal was notably absent. The most recent publications are personal narratives or single-perspective field observations that lack sound research methods, data collection, or analysis (e.g. Dell & T.H.E. Journal, 2014; Edwards, 2014; Mortensen, 2011; Nash, 2009). Edwards (2014) provided an example of such literature; Edwards, superintendent of North Carolina's Mooresville Graded School District, published an account of his

experience implementing a 1:1 digital conversion. The publication contained sample meeting agendas, teacher evaluation materials, and helpdesk procedures so that other districts could replicate his school system's process. In his narrative, he explained, "I believe a huge component of our success has been a commitment to collective, ubiquitous leadership" (p. 36). This claim is supported only by Edwards' experiences and observations of Mooresville's process.

Alberta Canada's one-to-one initiative yielded a literature review (Learning Cultures Consulting, 2006) and a support resource (Alberta Education, 2010) for 1:1 implementation, both of which make claims about the importance of leadership. Learning Cultures Consulting (2006) asserts that goals in 1:1 programs can be achieved when effective leaders collaborate across the organization, communicate a shared vision, provide financial, instructional, and technical support, and engage in ongoing progress monitoring. However, neither document provides substantial quantitative or qualitative support for that claim. Furthermore, Alberta Education (2010) states that the suggestions are based on participants' recommendations, but it is unclear how that information was gathered, collated, or analyzed.

The Berkshire Wireless Learning Initiative in western Massachusetts generated similar literature. Nash (2009) reported twelve lessons learned from the initiative. Nash's (2009) purpose was to report on operational issues rather than educational outcomes, which were evaluated by Boston College. Nash (2009) recommended that strong school leadership is critical to 1:1 initiatives' success, and that superintendents, principals, and curriculum directors be actively engaged in the implementation. However, the research methods used to arrive at this recommendation are unclear.

Without reliable research methods as the foundation, the validity of the claims set forth in the research based on personal experience and field observations (e.g. Edwards, 2014; Nash, 2009; Learning Cultures Consulting, 2006) is uncertain. The impact of biases and variables is unknown; therefore, transferability is in question. Basing formal program decisions on unsubstantiated claims is problematic; decisions based on unsubstantiated claims are potentially flawed decisions. This poses particular risk in large-scale initiatives where the stakes, both financial and educational, are high. Research is needed that uses systematic inquiry to understand the role of leadership in implementation of 1:1 initiatives.

There is a small body of empirical research that evaluates the principal's impact in implementation. For example, Greaves et al. (2012) reported findings from Project RED, and suggested that the principal's leadership is a significant factor influencing student outcomes by citing data that disciplinary action was reduced by 73% in 1:1 schools where the principal had change management training. The Project RED complete report (Greaves, Hayes, Wilson, Gielniak & Peterson, 2010) included a survey with closed-item questions regarding topics, settings, and frequency of professional development received (Greaves et al., 2010). Yet, this study did not indicate how the principals saw this training as influencing their experience. Towndrow and Vallance (2012) conducted a case study of two 1:1 contexts and made recommendations for leaders. The case studies revealed teacher and student attitudes and practices, which Towndrow and Vallance (2012) then connected to the decision making of leaders. Although the study made recommendations to leaders, principal attitudes and practices were not included in the study.

Some empirical research also provides initial insights into the role of the principal in a 1:1 initiative. The Project Red (Greaves et al., 2010) survey asked respondents to describe the role of the principal. Respondents identified modeling technology use, enabling time for teacher collaboration, and leading through change management strategies as key responsibilities, with 88%, 74%, and 67% of respondents identifying each, respectively. Respondents included principals, but also included superintendents, curriculum and instruction leaders, and technology leaders. Topper and Lancaster's (2013) case study of five Midwestern school districts revealed leadership and vision as a common theme, and suggested that it is the role of the principal to implement the district's vision for effective technology use. Primary data for the case study were interviews with superintendents, principals, and curriculum and technology directors. In neither study was the primary voice that of the principal.

The voice of the principal is essential to understanding leadership of 1:1 programs, as they are the persons charged with leading the change at the building level. Currently, there is a conceptual gap in 1:1 research leaving the experience of the principal largely unexplored. There is also a methodological gap, where principals are frequently not first-hand participants in the research. When principals are first-hand participants, their voices are combined with leaders in other roles. At a time when the field is striving to build leaders who not only understand instructional technology's potential, but also how to positively affect its use, it is imperative that we bring these missing voices to the forefront. How do we know what professional development will best support principals if we do not first understand their experience? How can we make recommendations for program leadership without first understanding how principals perceive their role,

promote change, and respond to successes and challenges? We must develop these understandings before we can evaluate the impact of the principal on 1:1 programs and take actions to build capacity for change leadership.

Technology Leadership

While research on the principal's role in the specific context of 1:1 programs is in its infancy, efforts have been made to examine the role of the principal as a technology leader (e.g. Afshari, Bakar, Luan, and Siraj, 2012; Chang 2011; Levin & Schrum, 2013). Understanding of technology leadership is critical in pursuing research on principals' experiences leading change in a 1:1 program. Research on technology leadership provides an important foundational understanding: the integration of technology into education creates a unique set of leadership needs and conditions, requiring a specific set of leadership skills (ISTE, 2012). The International Society for Technology in Education (2012) described technology leaders as individuals who can transform schools into digital age learning environments by accepting the challenges and opportunities of systemic reform and by supporting and sustaining change efforts in their contexts. Technology leadership has a significant impact on technology implementation; the principal's ability to be a technology leader has a direct impact on teachers' technology literacy and teaching effectiveness (Chang, 2012).

As researchers have examined technology leadership, several themes have emerged. First, principals have a variety of responsibilities as technology leaders, including establishing vision, providing opportunities for professional learning, and modeling technology use. Second, transformational and distributed leadership styles are effective approaches in technology leadership. Third, as technology leaders, principals

are challenged by limitations in resources and professional development. Additionally, the literature on technology leadership includes a set of standards for transformational leadership. Each of these themes and the standards will be examined in the following subsections: leadership responsibilities, leadership styles, leadership challenges, and standards.

Leadership responsibilities. With regard to leadership responsibilities, research suggests that vision setting, facilitating professional learning, and modeling technology use are important responsibilities of technology leaders (e.g. Eren & Kurt, 2011; Levin & Schrum, 2012). As was the case with much of the research on principal leadership in 1:1 programs, principals are often not the primary voice in this research. Chang, Chin, and Hsu (2008) and Chang (2012) gain insight into technology leadership from the perspective of teachers. Chang, Chin, and Hsu (2008) found that elementary teachers in seven Taiwanese cities perceived vision, staff development, infrastructure, and evaluation and research as critical constructs in technology leadership. Similarly, Chang (2012) suggested that technology leaders apply technology in organizational operations to improve performance and that principals are responsible for developing and implementing a technology vision and a plan that includes professional development. The recommendations were based on a survey of 1,000 Taiwanese teachers' perceptions; the survey explored their perceptions of principals' technology leadership effectiveness.

Cakir (2012), Levin and Schrum (2013), and Weng and Tang (2014) brought multiple stakeholders into the research. Cakir (2012) examined technology leadership from the perspectives of both computer teachers and school administrators. Administrators in the study indicated that they considered themselves technology leaders,

but interview responses from administrators focused on their expectations for teachers. Alternatively, teacher interviews focused more on the principals' leadership responsibilities, stating that principals need to engage in professional development on technology, set expectations for technology use, and support teachers in new technology practices.

Levin and Schrum (2013) argued that to leverage technology for school improvement, leaders must articulate a clear vision, mission, and goals; attend to school culture; plan for change that impacts curriculum and instruction; use data for assessment and evaluation; identify personnel and financial resources; implement an effective school organization; provide professional development; build community partnerships; and communicate openly with all stakeholders. Levin and Schrum's (2013) research was based on case studies of eight diverse secondary schools and districts, including small and large public, charter, and magnet schools. The study included the voices of school and district administrators, teachers, support staff, parents in leadership roles, and school board members. Weng and Tang (2014) conducted survey research with administrative staff from 82 Taiwanese elementary schools; administrative staff included principals and directors of academic affairs, student affairs, general affairs, and counseling. The administrators reported high self-efficacy in the leadership responsibilities of supply and support, modeling and guidance, vision and management, and communication and inspiration.

When principals are the sole participants, research uses quantitative methods. Eren and Kurt (2011) conducted survey research with 870 elementary school principals from 16 Turkish cities. Statistical analysis revealed vision, supply and use of technology,

and measurement and evaluation of technology as leadership responsibilities. The study also revealed that technology training positively impacts principal leadership. Banoglu (2011) also conducted survey research. Based on the study of 134 principals in Istanbul, Banoglu argued that creative, shared vision and technology planning skills are critical responsibilities for principals. While this survey research (Banoglu, 2011; Eren & Kurt, 2011) is important in revealing principals' beliefs, qualitative research is also needed that will enable rich description of their perceptions and experiences.

From both the research that does include principals and that which does not, we can conclude that vision setting; planning; providing and engaging in professional learning; and providing, adopting, and using new technologies are important responsibilities for principals in technology leadership. An understanding of these responsibilities provides a foundation for understanding the responsibilities of a principal in a 1:1 learning environment, as 1:1 computing is a subset of technology leadership. However, because these responsibilities have not yet been explored in a 1:1 setting specifically, it is not known how these responsibilities transfer. Further, research is needed that gives insight into principals' beliefs, attitudes, and needs as related to these leadership responsibilities. A qualitative methodology will enable a deeper understanding of their lived experience in technology leadership.

Leadership styles. Technology leadership research also makes recommendations for effective leadership styles. Afshari, Bakar, Luan, Fooi, and Samah (2009) conducted survey research with 320 secondary school principals implementing information and communication technologies in Tehran. Afshari et al. (2009) found that transformational leadership, which communicates vision and mission, monitors and attends to individual

needs, motivates, and intellectually stimulates, was the leadership style most frequently exhibited by principals. Transformational leadership was positively correlated with frequency of computer use (Afshari et al., 2009). In contrast, transactional leadership, where leaders focus on compensation for successful performance and may be passive in response to problems, showed no relationship to frequency of computer use. Afshari et al. (2012) further explored this survey data, focusing on influences of transformational leadership. Afshari et al. (2012) found statistically significant relationships between professional development activities and computer competence, between computer competence and frequency of use, and between frequency of use and transformational leadership. Transformational leadership creates the concern and motivation needed to implement change in technology initiatives (Afshari et al., 2009; Afshari et al., 2012).

Both Levin and Schrum (2013) and Petersen (2014) agree that distributed leadership, where the principal encourages staff members to "find their niches" (Levin & Schrum, 2013, p. 38), and ensure that the staff is fully committed is an effective style for successful technology leadership. Levin and Schrum (2013) studied technology leadership in eight award winning schools and districts; participants in the study recognized that one individual could not perform all of the responsibilities required for effective technology leadership. Effective leaders focused on building leadership teams by identifying strengths in others and encouraging them to become leaders. Petersen (2014) interviewed teachers in two Swedish schools regarding the principals' leadership in a technology initiative. The two schools exhibited two different styles of leadership: involvement leadership, and separating leadership. Petersen (2014) argued that the leader who demonstrated involvement leadership, which is synonymous with distributed

leadership, had a greater likelihood of success than the principal who was removed from instruction and less engaged in collaboration with teachers. Seong and Ho's (2012) case study of a Singapore elementary school implementing technology reform revealed that leaders used both transformational and distributed leadership styles to establish direction for the initiative, redesign the organization and its culture, develop the staff, and manage resources. Seong and Ho (2012) argued that distributed leadership enables the principal to focus more on transformational efforts. Spillane (2005) refers to the definition of distributed leadership ascribed to by Levin and Schrum (2013) and Seong and Ho (2012) as the "'leader plus' view," a superficial assessment of a more complex leadership phenomenon. Rather, Spillane (2005) describes distributed leadership as a practice that results from interactions among leaders, followers, and their situation. Spillane (2005) advises that researchers and leaders attend not to individuals' actions that contribute to the leadership of the organization, but to the interactions that are critical in practice.

Similar to research on the responsibilities of school administrators as technology leaders, research on effective technology leadership styles provides a foundation for understanding the role of the principal in the implementation of a 1:1 learning environment. Research on effective technology leadership styles is also significant for its inclusion of principal's attitudes and beliefs using self-report, primarily quantitative methods (Afshari et al., 2009; Afshari et al., 2012). However, in order to determine if the findings are applicable in the specific context of a 1:1 program, we must pursue qualitative research with principals leading change in that setting. The implementation of 1:1 computing initiatives is unique, as the focus is on creating environments where student computer use for learning is ubiquitous, in contrast to other technology initiatives

where the focus is on teacher computer use in instruction. Exploring the experience of principals leading a 1:1 initiative will address the conceptual and methodological gaps in the literature on 1:1 computing and strengthen the broader body of research on technology leadership by adding principals' first-person experiences to the discourse on technology leadership.

  Leadership challenges. Research on technology leadership also examines the challenges faced by leaders in this role. In a study of twelve Louisiana school districts, school leaders reported that they found themselves unprepared to be a technology leader (Leonard & Leonard, 2006). Chang et al. (2008) found that budget shortages and professional development were common challenges among elementary school principals in seven Taiwanese cities. This study echoed earlier findings of MacNeil and Delafield (1998), who found that principals and assistant principals in southeast Texas viewed budget and time for professional learning as primary challenges in technology leadership. Sincar (2013) provided a qualitative case study of principal perceptions of leadership challenges in technology leadership; results indicated bureaucracy, lack of resources, resistance to innovation, lack of in-service training, and poverty as primary challenges to implementation. Teachers also recognize the challenges for their administrators. Plessis and Webb (2012) found that teachers perceived the lack of project leadership and the need for professional development as the greatest extrinsic barriers to technology implementation. The recurrent theme of professional development as a challenge to technology leadership indicates that this is a key area of concern for principals.

  Research on the challenges faced by technology leaders can provide a basis for understanding the challenges that principals will face leading the changes associated with

a 1:1 initiative. It is critical, however, that we not only understand what the challenges are, but also how principals experience and respond to those challenges. A more thorough understanding of the leadership challenges faced by principals in the specific context of a 1:1 initiative will enable program leaders to design appropriate supports to enable school leaders to overcome these challenges.

Standards. Drawing on established research in instructional technology, the International Society for Technology in Education (ISTE) developed the ISTE Standards for Administrators (ISTE*A) to provide guidelines to leaders for effective technology leadership. ISTE is a nonprofit organization and leader in the field, improving teaching and learning by connecting a professional learning network of more than 10,000 teachers and advocating locally and nationally for educational technology (ISTE, n.d.). The ISTE*A Standards, formerly called the NETS*A, were developed based on national stakeholder consensus of indicators for effective leadership in the appropriate use of educational technology. The standards are a framework for successful technology implementation, and contain performance indicators reflective of transformational leadership for the digital age. ISTE (2012) explains that "Transformational leaders succeed in achieving organizational change by developing a shared vision for educational technology among all stakeholders and by empowering stakeholders at every level to be leaders in effecting change" (Leadership for Transformation section, para. 1).

These standards provide critical insight into digital age leadership by identifying knowledge and skills needed for effective technology leadership. The standards are divided into five categories, each described by a standard statement and performance indicators, as shown in Table 1. Collectively, these five categories represent necessary

skills and knowledge needed to lead digital age learning and technology implementation that will transform the education landscape (ISTE, 2012).

The ISTE*A standards provide a description of the skills needed for technology leadership, and have been applied in instructional technology research (Richardson, Bathon & Flora, 2013; Richardson, Bathon, Flora & Lewis, 2012; Richardson & McLeod, 2011; Sincar, 2013; Unal, Uzun & Karatas, 2015). They have not, however, been applied in an examination of principals' experiences leading the change to a 1:1 learning environment. Because research has yet to reveal the nuances of the leadership experience in this specific context, research must apply the ISTE*A standards as a lens for understanding the principals' experience in this context. This will yield a greater understanding of effective technology leadership as well as effective leadership in a 1:1 initiative.

Change Leadership

Volumes of work have been published describing the traits of effective leaders (e.g., Bennis, 2003; Collins, 2001; Covey, 1989; Fullan, 2001). Although these works are not specific to 1:1 programs or technology, they inform the field because the implementation of instructional technology requires strong leadership (e.g. Cakir, 2012; Chang, 2012; Chang et al., 2008; Eren & Kurt, 2011; Levin & Schrum, 2013). As noted in previous sections, leaders of technology initiatives face significant challenges, including teacher resistance (e.g. Sincar, 2013), limited resources, and limited professional development (e.g. Sincar 2013, Chang et al., 2008). Further, 1:1 computing

Table 1

ISTE Administrator Standards

Category	Standard Statement	Performance Indicator Summary
1. Visionary Leadership	"Educational Administrators inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization" (p. 1).	Develop and communicate a vision and aligned strategic plan for technology integration related to learning outcomes; advocacy to support implementation of vision and plan
2. Digital Age Learning Culture	"Educational Administrators create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students" (p. 1).	Develop and support instructional innovation and learner-centered environments across the curriculum, characterized by best practices for technology integration; model and promote technology use; promote and participate in learning communities
3. Excellence in Professional Practice	"Educational Administrators promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources" (p. 1).	Foster a culture of learning and professional growth, including the development of learning communities; remain informed about current research and emerging trends
4. Systemic Improvement	"Educational Administrators provide digital age leadership and management to continuously improve the organization through the effective use of information and technology resources" (p. 2).	Lead change that maximizes learning through technology; use data to improve performance and learning; recruit and retain effective personnel; create strategic partnerships; maintain technology infrastructure
5. Digital Citizenship	"Educational Administrators model and facilitate understanding of social ethical, and legal issues and responsibilities related to an evolving digital culture" (p. 2).	Ensure equitable access; model and guide the ethical use of technology; maintain policies for technology use

Note: Adapted from "ISTE Standards for Administrators" Copyright 2009 by the International Society for Technology in Education.

presents the unique challenge of transforming classrooms to learner-centered
environments that integrate technology into the curriculum in ways that redefine learning
tasks (e.g. Lowther et al., 2012; Mouza, 2008).

The transition to a 1:1 learning environment requires a change process.
Challenges must be overcome as new teaching methods and tools are implemented. In
this context, principals must serve as change leaders. Change leadership requires a set of
skills that go beyond the day-to-day management of a school; it is the ability to challenge
the status quo and guide others in the process. Marzano, Waters, and McNulty (2005) and
Fullan (2014) provide insights into the complexities of effective change leadership.
Through their work, we begin to define the nature of change experienced in a 1:1
initiative and the responsibilities of leaders enacting that change. This section begins by
defining orders of change and applying them to 1:1 computing. Then, the research of
Marzano et al. (2005) on the responsibilities necessary for second-order change
leadership is presented. Finally, Fullan's (2014) research on the change leadership actions
that maximize principals' impact on student achievement is discussed.

Orders of change. Change is a constant in education. New policies are approved,
new standards are implemented, and new assessments are mandated in a foreseeable
cycle. Because change is so common in education, many theorists have attempted to
define the dichotomous nature of change: well-defined vs. ill defined (Heifetz, 1994),
deep vs. superficial, immediately feasible vs. innovation driven (Argyris & Schon, 1978;
Cuban, 1988; Heifetz, 1994; Marzano et al., 2005). Each of these theories can be framed
in the context of first- or second-order change (Marzano et al., 2005).

First- and second-order change were first described by Cuban (1988), and were elaborated upon by Marzano et al. (2005). First- order change is that which is incremental and consistent with current values and norms (Cuban 1988; Marzano et al., 2005). Such changes give the appearance of significant improvements, but in reality do little to impact educational outcomes (Cuban, 1988). For example, the implementation of a new textbook series is a first-order change. The use of new materials gives the appearance of significant change, but is likely to have limited impact. It is a minimally disruptive change. In contrast, second-order change is that which is innovation-driven and irreversible, requiring dramatic departures from the past (Cuban, 1988; Marzano et al., 2005). For example, a change in grading practices from traditional grading scales to standards-based reporting is a second-order change. It challenges cultural norms of grading based on individual assignments and accumulated point values to institute an innovative approach based on progress towards mastery. A summary of the differences between first- and second-order change is presented in Table 2.

One-to-one computing as second order change. Richardson et al. (2013) argued that adding technology to a traditional curriculum does not address the needs of learners who must be skilled in creative and critical thinking, problem solving, communication, and collaboration in order to thrive in today's interconnected, technology driven world (Partnership for 21st Century Learning, 2009). Rather, technology must be used to transform teaching and learning, which is, as Marzano et al. (2005) described, a second-order change. Alternatively, adding computers to traditional, teacher-centered classrooms is a first-order change because teachers are not required to depart from their usual pedagogies, and computers are used primarily as tools, rather than as a driver for

innovative learning. Students may, for example, use a word processor rather than pen and paper for writing essays or an online resource for research rather than print materials.

In contrast, the most successful 1:1 initiatives in education require second-order change because they lead with student-centered pedagogy (Fullan, 2013). Teachers are challenged to act as facilitators of inquiry, not as purveyors of information. Students use technology to become, not only, consumers of information, but also producers of knowledge that is connected to a world outside of the schoolhouse (Fullan & Langworthy, 2014). This shift from teacher-centered teaching to student-centered learning, from teacher-directed instruction to student-driven and competency-based personalization, fundamentally changes the roles and responsibilities of educators, and is therefore a second-order change.

Table 2

Differences between first- and second-order change

First Order Change	Second Order Change
Attempts to limit disruptions while improving efficiency and effectiveness.	Disrupts to innovate solutions to persistent problems.
Assumes that current goals and structures are sufficient.	Results from dissatisfaction and challenges the status quo.
Consistent with current values and cultural norms.	Requires new knowledge and skills.
Has limited impact on outcomes	Has significant impact on outcomes.

Note: Summarized from School leadership that works by R. J. Marzano, T. Waters, and B. A. McNulty, 2005. Copyright 2005 by Association for Supervision and Curriculum Development.

Second-order change leadership responsibilities. Marzano et al. (2005) argued that it is the responsibility of principals to lead changes that will improve teaching and

learning. To further define that responsibility, Marzano et al. (2005) conducted a meta-analysis of effective school leadership research. The meta-analysis reviewed sixty-nine studies from 1978-2001, reflecting leadership in 2,802 schools. The research revealed a significant correlation between the leadership behaviors of the school principal and the average academic achievement of students in the school (Marzano et al., 2005). From the meta-analysis, Marzano et al. (2005) developed a list of 21 essential responsibilities, each bearing its own correlation to student academic achievement, as shown in Table 3. Through this analysis, Marzano et al. (2005) described research-based best practices for leaders. Marzano et al. (2005) also asserted that their findings "validate the opinions expressed by leadership theorists for decades" (p. 41), including Fullan's seminal research on the change process.

Marzano et al. (2005) identified seven specific responsibilities critical to successful second-order change: Change Agent, Flexibility, Ideals and Beliefs, Intellectual Stimulation, Knowledge of Curriculum, Instruction, and Assessment, Monitor and Evaluate, and Optimizer. These responsibilities require that the principal be knowledgeable about an innovation's impact on curriculum, instruction, and assessment, including research and theory (Marzano et al., 2005). The principal is responsible for communicating and fostering knowledge with teachers (Marzano et al., 2005). The principal must also challenge the status quo, encourage a positive outlook, and articulate and demonstrate educational ideals and beliefs (Marzano et al., 2005).

Table 3

Marzano, Waters, and McNulty's (2005) leadership responsibilities and correlations (r)

to student achievement.

Leadership Responsibility	Average *r*	95% CI	No. of Studies	No. of Schools
Situational Awareness	.33	.11 to .51	5	91
Flexibility	.28	.16 to .39	6	277
Monitoring/Evaluation	.27	.22 to .32	31	1,129
Discipline	.27	.18 to .35	12	437
Outreach	.27	.18 to .35	14	478
Input	.25	.18 to .32	16	669
Culture	.25	.18 to .31	15	819
Resources	.25	.17 to .32	17	571
Change Agent	.25	.16 to .34	6	466
Order	.25	.16 to .33	17	456
Knowledge of Curriculum, Instruction, and Assessment	.25	.15 to .34	10	368
Focus	.24	.19 to .29	44	1,619
Contingent Rewards	.24	.15 to .32	9	465
Intellectual Stimulation	.24	.13 to .34	4	302
Communication	.23	.12 to .33	11	299
Ideals/Beliefs	.22	.14 to .30	7	513
Involvement in Curriculum, Instruction, and Assessment	.20	.14 to .27	23	826
Optimizer	.20	.13 to .27	17	724
Visibility	.20	.11 to .28	13	477
Affirmation	.19	.08 to .29	6	322

Note. Average r = correlation to student achievement; CI = confidence interval; No. of Studies = number of studies; No. of Schools = number of schools involved in computing the correlation. Adapted from School leadership that works by R. J. Marzano, T. Waters, & B. A. McNulty, 2005. Copyright 2005 by Association for Supervision and Curriculum Development.

The research (Marzano et al., 2005) revealed that while some

responsibilities were important to either type of change (Monitoring/Evaluation,

Ideals/Beliefs, Knowledge of Curriculum, Instruction, and Assessment) others were less

important or had an inverse relationship (Marzano et al., 2005). For example, three

responsibilities important to second-order change were of minimal importance in first

order change: Change Agent, Optimizer, and Flexibility. Because second order changes

require a departure from past practice, it is important that the leader is able to challenge

the status quo and inspire others to adopt challenging innovations; this is not the case in

first-order change (Marzano et al., 2005). Additionally, four responsibilities important for

first-order change have a negative relationship to second-order change: Culture,

Communication, Order, and Input (Marzano et al., 2005). For example, Marzano et al.

(2005) indicated that staff perceptions related to second-order change might include:

"Team spirit, cooperation, and common language have deteriorated as a result of the

innovation (Culture)" and "Order and routine have deteriorated as a result of the

innovation" (p. 74). This negative relationship does not indicate that principals can or

should avoid these responsibilities. Rather, the principal must be aware of potential

negative reactions and prepare to respond accordingly.

Although there is a negative relationship, culture is critical to second-order

change. Culture is challenging to define, as research in the past thirty years has used a

variety of approaches to defining culture (Schien, 2004). Schien (2004) defines culture as

the shared, stable group identity that is deeply imbedded and pervasive. Schien (2004)

also argues that culture can be analyzed at three levels: observable artefacts, espoused

beliefs and values, and underlying assumptions. In order to understand a group's culture,

researchers must understand the shared assumptions and how they were reached through

both the development of beliefs and values and the adoption of organizational structures

and processes. In their research on the responsibilities of school leaders, Marzano et al.

(2005) echoed this definition in their explanation of culture as shared values, beliefs, and

feelings, with cultural priorities revealed by artefacts.

In his seminal research on the change process, Fullan (2007) described change as a reculturing, wherein teachers question and change their beliefs and behaviors. Effective change leadership requires an understanding that culture changes only through leadership actions; the principal must model the transformation (Reeves, 2009). Schien (2004) argued that that leadership creates and changes cultures, while management acts within the current culture. The effective change leader promotes cohesion and well-being among staff, and develops a shared vision and purpose as related to the change (Marzano et al., 2005). Edwards (2014), Superintendent Mooresville Graded School District, reflected on the role of culture in their second-order change initiative to 1:1 learning environments and indicated that positive, collaborative culture is critical because teachers must continually learn and change. While Edwards' (2014) reflections provide some insight into the experiences of leaders in a 1:1 initiative, more research is needed to understand how principals lead the second-order change to a 1:1 learning environment. The current research on 1:1 computing initiatives does not pursue an understanding of the principals' experience in undertaking the aforementioned leadership responsibilities, and Marzano et al. (2005) did not include specific reference to 1:1 computing initiatives. Research is needed that makes connections between the established research on leading second-order change and the new context of 1:1 computing. Drawing these connections will deepen our understanding of the change process and further the role of the principal in leading transformative changes in education.

Maximizing impact through strategic change leadership. Fullan (2007) stated that the role of the principal is to lead change "on the ground" (p. 156); however, Fullan (2014) also argued that the traditional idea of the principal as direct instructional leader is

ineffective change leadership. Rather, the most effective change leadership occurs when principals engage the staff in intrinsically motivating, collaborative change efforts towards meaningful, unreached goals, supported by an emphasis on teacher learning (Fullan, 2014). This approach to change leadership maximizes student learning by maximizing teacher learning (Fullan, 2014). Fullan (2014) argued that there are three tenets principals can follow to lead meaningful change and maximize their impact: 1) leading learning, 2) being a district and system player, and 3) becoming a change agent.

Leading learning. Leading learning focuses on what Marzano et al. (2005) labeled Intellectual Stimulation. Fullan (2014) offered professional capital as the framework for becoming a leader of learning. Professional capital is a three-part construct comprised of human, social, and decisional capital (Fullan, 2014; Hargreaves & Fullan, 2012). Human capital is defined as the teaching capacity of the staff, social capital is defined as the quality of the relationships among the staff, and decisional capital is defined as the ability of the staff to make sound professional decisions (Fullan, 2014; Hargreaves & Fullan, 2012). The three components are interdependent. Fullan (2014) explained, "decisional capital is about cultivating human and social capital over time, deliberately identifying and spreading the instructional practices that are most effective for meeting the learning goals of the school" (p.82). To lead change, the principal must build a culture of collective learning, wherein the principal develops the staff's expertise, and in turn, group learning improves the teaching capacity of individuals (Fullan, 2014). As seen in research on 1:1 computing, professional learning (e.g. Claro et al., 2012) and fidelity of implementation (e.g. Greaves et al., 2012) are critical to program success. An emphasis

on building professional capital will help ensure that new pedagogies with effective uses of technologies are implemented throughout the school.

Being a system and district player. Fullan (2014) argued that effective change leaders are district and system players. Collaboration becomes a strategy for change. Principals who are district and system players connect themselves and their teachers with other schools both inside and outside of the district, with the goals of sharing expertise and developing culture (Fullan, 2014). For example, Mooresville Graded School District has opened their doors so that outside teachers, principals, and district leaders can observe a 1:1 learning environment and ask questions about implementation with the goal of moving their work forward. Being a district and system player supports the development of professional capital as learning is shared among and between schools and districts.

Becoming a change agent. Becoming a change agent is reflective of several responsibilities identified by Marzano et al. (2005). Fullan (2014) characterized a change agent as flexible, committed to the change, and able to build trust, which aligns with the second-order change leadership responsibilities of flexibility, and ideals and values (Marzano et al., 2005). Fullan (2014) added to the definition of change agent the ability to build trust, to create a plan and build collective ownership of that plan, focus on the collective over the individual, productive urgency for long-term results, commitment to self-improvement, and development of external partnerships.

Fullan's (2014) three tenets for maximizing impact are important to the research on principal leadership in 1:1 computing because they provide direction for effectively driving change. More significantly, Fullan (2014) related this work to Stratosphere

(Fullan, 2013), and discussed the leadership of the principal in the context of technology initiatives. Fullan (2014) emphasized the role of the school leader in driving the second-order change to new pedagogies: "Leaders who become partners in the deep learning processes, and who foster collaborative, risk-sharing cultures, invite and expand inherent change in schools and systems where the new pedagogies are taking off" (p. iii). Fullan (2014) provided examples from three secondary schools that were integrating technology, although not with a specific plan to do so or direction from the district. The schools were not necessarily 1:1, but either had ample technology or implemented a BYOD program. Fullan (2014) asked these principals how they view their role, and their responses were reflective of the three keys to maximizing impact. Although this begins to provide insight into principals' experiences, more research is necessary. Research on elementary school principals' experiences leading the changes associated with a district-directed 1:1 initiative will provide a critical understanding of change leadership in a context that has not yet been examined. It is not yet known how change leadership research applies in the specific context of 1:1 computing. Research in this setting will not only strengthen our understanding of 1:1 program implementation, but also provide new perspectives on change leadership as a whole.

Change Theory

How organizations and people within those organizations change is a complex phenomenon, made even more complex in large-scale initiatives such as district-wide 1:1 computing. In fact, the field of change research has repeatedly indicated that approximately 70% of change efforts fail (Hughes, 2011). School system leaders can draw on change process research to more successfully implement 1:1 computing

initiatives. Fullan (2007), Rogers (2003), Lewin (1997), Kotter (2012), and Bridges (2003) each provide a framework for understanding the complex change process. Research must build upon these established theories and offer a new perspective on change, illuminating the process in the specific context of a 1:1 computing initiative.

Change models. To describe how organizations and people within those organizations change, research has offered several different models. Multiple modes have been accepted within the field, including those created by Lewin (1997), Kotter (2012), Bridges (2003), Rogers (2003), and Fullan (2007). Lewin's work in group dynamics led to the development of a three-step model. Lewin's three phases are un-freezing, where people become motivated to change; moving, where the change occurs; and freezing, where the change becomes permanent.

Kotter (2012) described change as an eight-step process, where the steps reflect common errors that impair change efforts. The process included:

1) establishing a sense of urgency,

2) creating a guiding coalition,

3) developing a vision and strategy,

4) communicating the change vision,

5) empowering employees for broad-based action,

6) generating short-term wins,

7) consolidating gains and producing more change, and

8) anchoring new approaches in the culture.

Steps one through four "defrost a hardened status quo" (p. 22), and align with Lewin's un-freezing phase. Steps five through seven introduce the change and align with Lewin's

second phase. Step eight solidifies the change in the culture, and aligns with Lewin's final phase.

Bridges (2003) argued for a three-phase model, but emphasizes transitions, rather than change. Bridges defines change as situational and outcome driven, such as a change from paper-based to digital curriculum and assessments. Transitions, Bridges claimed, are the psychological processes surrounding the change. The process begins with ending, losing, and letting go, followed by a neutral zone characterized by ambiguity as the change is adopted, and finally a new beginning where the change is embraced.

Unlike Bridges, Fullan (2007) and Rogers (2003) define change as a process that moves from initiation to implementation to institutionalization. The initiation phase is the process leading up to and including a decision to change; implementation is execution of that change in practice (Fullan, 2007). Institutionalization, the routinization and incorporation of the change within the system, is largely dependent upon successful initiation and implementation (Fullan, 2007). Fullan's (2007) change theory, specifically initiation and implementation, is the focus of this literature review because it most closely aligns with Stratosphere (Fullan, 2013), the conceptual framework for this research. Stratosphere represents the convergence of technology, pedagogy, and change knowledge to transform education (Fullan, 2013). Focusing on Fullan's change model provides consistency with the conceptual framework. Further, initiation and implementation describe the process followed by the population studied. Complementing theories will be discussed in relation to the stages of initiation and implementation in order to provide a comprehensive description of the change process. This description provides a foundation upon which to build research on the change process in 1:1 computing.

Initiation. Initiation decisions are informed by both internal and external factors including existence, quality, and access to innovations; advocacy from central administration and teachers; external change agents; community influences; policy and funding; and problem-solving and bureaucratic orientations of districts. Very often, a combination of factors influences the initiation decision. The growth of 1:1 initiatives, for example, has been influenced by the combination of rigorous academic standards such as the Common Core and Next Generation Science Standards, PARCC's computer-based testing requirements, and 21st century pedagogy. Fullan (2007) suggests, however, that it "matters less who initiates the change and more what the subsequent quality of the change process is" (p. 81).

This is not to say that who initiates the change is not a critical factor for consideration. Fullan (2007) explains that bottom-up change is rarely effective for large-scale reform. Conversely, top-down change also rarely works, especially when it imposes change without gaining buy-in from constituents (Fullan, 2007). Yet, even when leaders attempt to gain buy-in prior to implementation, it can be unclear whether that commitment is genuine. In fact, the buy-in may be more a response to effective publicity rather than an informed decision. To achieve balance between top-down and bottom-up change, Fullan (2007) suggests that assertive initiation be combined with empowerment and choice for stakeholders during the change process.

Implementation. Once the decision to initiate change has been made, the hard work of implementation begins. It is during implementation that individual users make the decision to adopt the innovation. In the case of a district-wide 1:1 computing initiative, implementation occurs on several levels. District-level leaders first make the

initiation decision to change policy and infrastructure to support the initiative, to revise curricula to reflect new pedagogy, and to support school leaders with ongoing professional development. Then, principals make an implementation decision. They choose whether or not to alter site-based structures and expectations to align with and support the change. In turn, teachers make the implementation decision to change, or not to change, their pedagogical approaches and utilize 1:1 computing in instruction. Leaders can inform their understanding of the process using Rogers (2003) innovation-decision process model. According to Rogers (2003), individuals progress through five-stages: (1) knowledge of an innovation, (2) persuasion, informed by the perceived characteristics of the innovation, (3) decision to adopt or reject, (4) implementation of the decision, and (5) confirmation of the decision. Kotter (2012) provides additional guidance to leaders during implementation. To support teachers in making the decision to adopt, leaders must establish a sense of urgency, create a guiding coalition, develop and communicate the vision, empower employees, and generate short-term wins (Kotter, 2012).

Implementation decisions are also driven by disconfirmation. Disconfirmation is the dissatisfaction or frustration that an individual feels when presented with information that disconfirms his or her current understanding (Schein, 1996). If that disconfirming information is accepted as valid and relevant, and associated with something the individual cares about, such as student achievement, survival anxiety and survival guilt are created (Schein, 1996). Survival anxiety and guilt are the feelings created when the individual feels that change is necessary or goals will not be met (Schein, 1996). This, in turn, creates learning anxiety, the feeling that initiating change recognizes that the status quo was flawed (Schein, 1996). Learning anxiety is the "key to producing change"

(Schein, 1996, p. 60). For example, if a teacher who sees little value in technology is presented with evidence of increased student learning and decreased absenteeism and discipline problems in 1:1 environments (Rosen & Beck-Hill, 2012), she may be compelled to change in order to meet her goals for student achievement. Survival and learning anxieties must be balanced with a sense of psychological safety in order to motivate individuals to change (Schein, 1996).

Adoption. The rate with which these individual change decisions are made is referred to as rate of adoption (Rogers, 2003). Given schools' overloaded improvement agendas, Fullan (2007) suggests that to support implementation and increase the rate of adoption, leaders must make clear the need for change, the goals and means of the change, the complexity of the change, and the quality and practicality of the change initiative. Bridges (2005) provides a mnemonic for supporting adoption with the "Four Ps:" purpose, picture, plan, and part (p. 60). In order for change to occur, leaders must explain the purpose, or outcome and supporting logic, paint a picture that will help others imagine what the outcome will look and feel like, explain the step-by-step plan for implementation, and explain each person's part in achieving the outcome (Bridges, 2005). While purpose, picture, plan, and part may receive different emphases depending upon the particular change initiative, each must be considered (Bridges, 2005).

Related to implementation and rate of adoption are the perceived attributes of innovation as defined by Rogers (2003). Rogers (2003) identifies the characteristics of innovations as relative advantage, compatibility, complexity, trialability, and observability. With the exception of complexity, which is the inverse, increased levels of these attributes will increase the rate of adoption. The perception that the change and

innovation are more desirable than the status quo results in increased relative advantage and will increase rate of adoption. For example, to increase relative advantage, school leaders might emphasize that 1:1 computing enables access to a wider range of more up-to-date materials than ever possible in a paper-based curriculum. To increase observability, district leaders may establish pilot schools and facilitate interschool visitations. One way leaders can increase rate of adoption is by crafting messages of need, relative advantage, compatibility, and quality and practicality, and communicating them continuously with the organization and its stakeholders.

While rate of adoption is important, it is not the only critical factor in implementation. In some instances, a slower rate of adoption is acceptable if the change sought is more ambitious. Less complex changes are typically adopted more rapidly and cause fewer challenges in implementation (Rogers, 2003; Fullan, 2007), but they also make a lesser impact. More complex changes designed to make a greater impact are more challenging to implement (Rogers, 2003; Fullan, 2007). Fullan (2007) argues that the type of complex changes needed to make systemic improvements in education require a substantial effort, which may slow the rate of adoption. For example, 1:1 initiatives that include both pedagogical changes and hardware/software changes are complex, and may consequently exhibit a slower rate of adoption than other changes. Moderately complex changes can take two to four years to move from initiation to institutionalization; a large-scale effort, such as a 1:1 instructional digital conversion including new curriculum, assessments, pedagogy, and technology, can take five to ten years to become institutionalized. This seems like a lengthy timeline when the moral imperative is to educate students now. School system leaders can draw on change process research to

more effectively and efficiently implement 1:1 computing initiatives. When change

knowledge informs policy and implementation strategy, success will come more quickly

(Fullan, 2007).

Rogers (2003) also suggests that rate of adoption will increase if the innovation is

perceived as an improvement that is compatible with existing values. However, when the

change initiated challenges the status quo, the innovation is likely not compatible with

existing values, experiences, and needs. For example, in many districts, the innovation of

student-centered personalized learning in a 1:1 environment will not be compatible with

existing norms of predominantly teacher-centered direct instruction. Although such a

contrast slows the rate of adoption, successful change is possible when preceded by the

adoption of a new value system (Rogers, 2003). Fullan (2007) describes this process in

schools as reculturing, the process by which teachers "question and change their beliefs

and habits" (p. 25). Reculturing is distinctly different from restructuring, which is limited

to superficial changes in process that do not fundamentally change existing norms or

values.

The characteristics of the change are not the only factors influencing adoption.

Local characteristics, including support from the district, community, principals, and

teachers, and external factors, such as government influences, can both positively and

negatively impact implementation. It is critical that leaders analyze all factors influencing

implementation and are prepared to respond, as any factors opposing implementation will

impact the effectiveness of the change process (Fullan, 2007).

Action decisions. Leaders can use Kotter's (2012) eight-step process, specifically

steps one through seven, as a guide when making decisions in the implementation

process. Early in implementation, decisions must be made that establish a sense of urgency, create a guiding coalition, develop a vision and strategy, and communicate the change vision (Kotter, 2012). As the change is implemented, decisions must be made that empower employees for broad-based action and generate short-term wins (Kotter, 2012). As short-term wins are attained, more change can be accomplished and the decision can be made to realize larger goals (Kotter, 2012).

However, as is the case in initiation, the implementation process is highly context-dependent. Implementation in one school system may look very different than the implementation in another school system, even when the innovations are similar. Fullan (2007) cautions, "Assume that no amount of knowledge will ever make totally clear what action should be taken. Action decisions are a combination of valid knowledge, political considerations, on-the-spot decision, and intuition" (p. 124). When making action decisions, it is the responsibility of the leader to continually monitor and evaluate the implementation. Leaders must be proactive in their decision making, while also being flexible and responsive to situational needs.

As leaders monitor and evaluate the implementation, they must be cognizant of the highly personal and highly emotional nature of the change process. One limitation of Roger's (2003) change process model is its depiction of change as primarily intellectual work, for both the leaders and the potential adopters. For some adopters, it is a grieving process. It requires an ending, a letting go of previous practices and identities, which in turn creates anxiety and struggle (Fullan, 2007; Bridges, 2003). Bridges (2003) described this psychological experience as transition, a three-phase process of ending, neutral zone (repatterning), and new beginning. Leaders must be cognizant of the emotions of loss and

anxiety that individuals may feel, and be prepared to guide adopters through that transition. These emotions can be compounded when the implementation is top-down. In such instances, the innovation-decision process does not include non-adoption as a choice. For example, in a district-wide 1:1 initiative, schools will be issued devices, and they will be expected to implement the initiative with fidelity. Principals and teachers feel pressure, not choice, for adoption; they are coping with the change. In this situation, the desire to not adopt may manifest itself as resistance. As leaders at the school and district level prepare to take actions during implementation, they must anticipate resistance and be prepared for the intended and unintended consequences of resistors. An understanding of the personal and emotional nature of the change process enables leaders to be responsive to the individuals whom the change impacts.

Fullan (2007), Rogers (2003), Kotter (2012), and Bridges (2003) seminal research provides a useful foundation for leaders to understand the change process. These theories have many practical applications and can be used when planning change and making recommendations to leaders implementing change. However, as Fullan (2007) indicates, the change process is highly contextual, and the current body of research on 1:1 computing lacks an understanding of how principals experience the implementation of such an initiative. Research must build upon these established theories to offer insights into the change process in the process in the specific context of a 1:1 computing initiative.

Summary

Through the research on 1:1 computing, technology leadership, and change leadership, we begin to gain insight into the role of the principal in leading the changes

associated with a 1:1 computing initiative. However, the literature has not yet explored the phenomenon of principal leadership in this context and their role in driving the change within the school environment. The role of the principal is largely unexplored in research on 1:1 computing, and it is yet to be determined if findings related to technology leadership and change leadership can be generalized to the specific context of 1:1 computing. The field has a thorough body of literature on change theory, but research is needed that examines the process in the specific context of a 1:1 computing initiative.

If a 1:1 initiative succumbs to the historical 70% failure rate (Hughes, 2011), millions of dollars can be lost, and worse yet, we rob our students of the modern learning environments they deserve. Even with this knowledge, we continue to implement change initiatives without understanding the experience of the persons charged with leading the change at the building level. In the majority of studies that make recommendations regarding leadership, principals are either not first-hand participants (e.g. Storz & Hoffman, 2013; Towndrow & Vallance, 2012), or their voices are combined with the voices of leaders in other roles (e.g. Greaves et al., 2010; Topper & Lancaster, 2013). Understanding the experience from the perspective of those living it will enable us to more effectively build capacity for principals' change leadership in 1:1 settings, thereby helping to ensure the initiatives' success.

CHAPTER III: METHODOLOGY

Research on 1:1 computing in schools has a significant history in the field of instructional technology (e.g. Baker, et al., 1990; Tierney, 1988). The number of 1:1 programs has continued to increase as schools aim to meet the needs of modern learners, and leaders of these programs look to research on 1:1 computing for guidance and justification. The current body of research on 1:1 computing offers leaders examples of positive student outcomes that can be used to justify the investment to stakeholders (e.g. Dunleavy & Heinecke, 2007; Rosen & Beck-Hill, 2012). The research also offers best practices for implementing the changes associated with 1:1 learning environments (e.g. Greaves et al., 2012; Storz & Hoffman, 2013).

With regard to leadership in 1:1 learning environments, research suggests that the principal's role is critical to the initiative's success (e.g. Greaves, et al., 2012; Towndrow & Vallance, 2012). Research on technology leadership and change leadership affirms the principal's importance and provides insight into that role, including: leadership responsibilities (e.g. Eren & Kurt, 2011; Fullan, 2014; Levin & Schrum, 2012; Marzano et al., 3005), leadership styles (e.g. Afshari, et al., 2009; Levin & Schrum, 2012; Seong and Ho, 2012), challenges (e.g. Chang et al., 2008; Sincar, 2013), and critical knowledge and skills (ISTE, 2012). However, the aforementioned research on technology leadership and change leadership does not reveal the nuances of the principal's leadership role in the specific context of a 1:1 initiative. Current research does not explore the role of the principal from the principal's perspective. Because the change process is highly contextual (Fullan, 2007), the field's understanding of the principal's role in change leadership is incomplete.

The field must work towards building a research and knowledge base on the principal's role in leading 1:1 computing initiatives. Fullan (2007) cautions that change initiatives often fail because we do not understand the "phenomenology of change" (p. 8) from the perspective of those who actually live it. We cannot risk failure in these initiatives because we fail to understand the experience of the principals leading this second-order change. By engaging in phenomenological research with principals, their lived experience can be described and synthesized, resulting in an essential description of shared experience. The resulting outcomes and implications that come from understanding common experience are significant, as they provide a lens through which to reflect upon current practices, as well as a foundation for future research pursuing changes in the field that will maximize program effectiveness.

The purpose of this study is to build an understanding of principals' experience in leading the changes associated with a 1:1 initiative and the contexts or situations that influence those experiences. This study explores the beliefs, attitudes, and needs of school principals in order to derive an essence of what it means to lead change. This chapter presents the study's methodology, and is organized into ten sections: research questions, research design and rationale, setting, participants, data collection and procedures, role of the researcher, data analysis, credibility of the data, limitations, and summary.

Research Questions

This study addresses limitations in our understanding of change leadership in K-12 1:1 computing initiatives by describing principals' lived experience. Revealing the essence of change leadership in this setting will guide us in understanding how to pursue

the changes associated with 1:1 computing. To explore the phenomenon of change leadership in a 1:1 initiative, one overarching question and several focused questions guide this research. The research questions that drive this inquiry ask "what" and "how" as related to the principals' experiences to indicate an emphasis on description from the perspective of the participants.

The position of key words in phenomenological research questions drives what is of primary importance and what data is collected (Moustakas, 1994). The key components of this research are what is of primary importance: *experience*, *principals*, *change*, and *1:1 computing*. One central question and several focused sub-questions guided this research. Following models set forth by Moustakas (1994), the central question driving this study was:

- What is the experience of principals leading change in a 1:1 computing initiative?

Three sub-questions clarified the intent of the investigation by defining the meaning of "experience" in this study. The sub-questions were:

- How do principals view their role and responsibilities in leading change in a 1:1 initiative?

- How do principals promote change in their schools in a 1:1 initiative? and

- How do principals' respond to successes and challenges in a 1:1 initiative?

Research Design and Rationale

Phenomenology is both a school of philosophy and a methodology for research. As a philosophy, phenomenology is characterized by an emphasis on understanding human experience and consciousness without presuppositions (Merriam, 2009;

Moustakas 1994). As a methodology, phenomenology leads to an understanding of the essence of a human experience. Phenomenology was selected for this study, as the aim of this research is to understand a human experience that has not yet been explored—the principal's role in leading change in a 1:1 initiative—and to develop a composite description that reflects the essence of this experience.

Phenomenological philosophy. Creswell (2013) explained that by the late 19th century, philosophy had become characterized by scientism, the exploration of the world through empirical means. Moustakas (1994) gave credit to Husserl, one of the pioneers of phenomenological philosophy, for developing "a philosophic system rooted in subjective openness, a radical approach to science that was [at that time] criticized" (p. 25). Phenomenological philosophy believes that consciousness, intuition, and essence come before empirical knowledge (Moustakas, 1994). In this way, phenomenology stood in stark contrast to other modern philosophies.

At the core of phenomenological philosophy are the concepts of intentionality, noema, and noesis. Moustakas (1994) defines intentionality as consciousness, "the internal experience of being conscious of something" (p. 28). The 'something,' or object, which the person perceives may be either real or imaginary (Moustakas, 1994). Every intentionality is comprised of noema and noesis. Noema refers to the object, but not in its literal or physical sense. The noema is the experiencing person's perception of the object, which Husserl described as the object "perceived as such" (Moustakas, 1994, p. 70). The noesis is that person's thinking about the noema, which is subjective and includes reflections, emotions, and judgments (Moustakas, 1994). Because every intentionality contains an interrelated noema and a noesis, phenomenology rejects a subject-object

dichotomy (Creswell, 2013). The noema and the noesis form the basis of the textural and structural descriptions in phenomenology, the descriptions of what is experienced and how. It is through understanding and synthesizing the noema and noesis of an experience that a researcher arrives at essences (Moustakas, 1994).

Phenomenological methods. Phenomenological philosophy underlies all qualitative research because of its focus on the lived experiences of individuals (Merriam, 2009); however, a researcher can also engage in specific phenomenological methods that are unique from other qualitative methods. Phenomenological research assumes that there are shared human experiences, and that those shared experiences have an essence or core meaning (Merriam, 2009). The purpose of a phenomenological study is to develop descriptions of those essences (Moustakas, 1994). In this study, the participants will experience the phenomenon of leading change in a variety of individual settings, and phenomenological methodology will uncover a rich description of the shared essence of that experience.

Phenomenology is also particularly "well suited to studying affective, emotional, and often intense human experiences" (Merriam, 2009, p. 26)." Phenomenological studies address such experiences as grief, jealousy, and gender issues. The phenomenon of leading change is well suited for phenomenological inquiry, as research indicates that change is a highly emotional experience (Bridges, 2003; Fullan, 2007). The experiences of ending, letting go, and new beginnings that are associated with change can create feelings of grief and anxiety (Bridges, 2003). Through the collection of personal journals and interviews that reveal the emotions of this experience, this research examines how principals experience leading change.

Phenomenological research may be either hermeneutical or transcendental. Hermeneutical phenomenology offers a flexible approach with emphasis on researchers' interpretation of the experiences, whereas transcendental phenomenology emphasizes the description of participants' experiences (Creswell, 2013). This study employs transcendental phenomenology following a modified Van Kaam method of data analysis as described by Moustakas' (1994). Using the Van Kaam method, the researcher uses her own analytical skill to make comparisons between participant statements and uses discipline specific terminology and frameworks to describe the phenomenon.

Setting

The setting of this study is a large Mid-Atlantic school district. The school district serves more than 108,000 students and more than 18,000 employees, nearly 9,000 of which are teachers, at 174 schools. Each school is led by a leadership team consisting of one principal and at least one assistant principal. The school district is extremely diverse and is a majority minority system, with 51.5% of its students of Asian, African American, or Hispanic/Latino descent. The school system is also geographically diverse, with urban, suburban, and rural areas.

The school district is currently in the early implementation stages of a five-year plan for a system-wide instructional digital conversion. This plan is the vision of the superintendent, who was in his third year with the district at the time of this study. In his first year, the superintendent revised the master plan, with collaboration from multiple community stakeholder groups. This revised plan sets forth a theory of action that includes providing an "equitable, effective digital learning environment" for all students across all grades (K-12).

The digital conversion represents a fundamental shift in teaching and learning, with the goal of graduating globally competitive students equipped with 21st century skills. To this end, all students will have access to a mobile digital learning device and a personalized, blended, interactive curriculum. Through ongoing professional development with all teachers, staff, and administration, the district has emphasized the program as a shift to student-centered learning, and the importance of technology as a tool to support that change in pedagogy. Although this setting was selected because of convenience, access, and an opportunity to impact the field, it is significant and worthy of study as one of the largest-scale 1:1 computing initiatives in the country.

Participants

The participants in this study were eight of the ten elementary school principals leading the school system's pilot for the 1:1 initiative. Convenience sampling was used to identify the participants. The school system identified ten schools to pilot device implementation and instructional changes. Two of the ten schools were identified as part of a state grant and one was selected because it was a new school. The remaining seven schools were identified through an application process. Schools were surveyed to determine principal interest. Interested schools were required to demonstrate teacher support, as measured by a survey sent directly to the teachers by the district's Department of Research, Accountability, and Assessment. Those meeting a preset minimum score were invited to submit a written application. An administrative team evaluated the applications and the superintendent provided final approval. The schools reflect the geographic and socioeconomic diversity of the district, and one represents a unique case,

as it was already a lab school. One principal was excluded from this study because he resigned mid-year, and one principal was excluded due to insufficient data.

Because of the diversity of the individual settings, the eight participants experienced the phenomenon in a variety of distinctive contexts. This diversity is reflected in the individual textural and structural descriptions, which led to rich composite descriptions that synthesized their distinctly different and setting-specific experiences. As a result, this research yields a greater understanding of the essence of the experience than what would be gained through study of a more homogeneous population. Demographic information about the specific schools is included in Chapter IV.

As part of the school system's pilot for the 1:1 initiative, all of the pilot principals were required to participate in a professional learning community (PLC). Beginning in February 2014, the PLC met once a month. The assistant principals and instructional coaches in each building participated as well. During these meetings, the principals engaged in professional development experiences about student-centered learning environments and other relevant instructional and technology related topics. In June 2014, the principals and their staffs attended a three-day summer institute to prepare for the implementation of devices and new pedagogies. PLC meetings continued throughout the following school year. These meetings included classroom visitations between schools to observe the implementation of 1:1 computing in each setting.

Data Collection and Procedures

Data was collected through journals and interviews. Using private journals afforded participants the ability to reflect outside of the group PLC setting; this provided the opportunity for participants to be totally honest and reflect without fear of judgment by

peers (Dwyer, Piquette, Buckle & McCaslin, 2013). Principals were asked to submit their journal entries to a private wiki, viewable only by the individual participant and the researcher. Following the journaling period, additional data was collected through traditional phenomenological semi-structured interviews. The interviews enabled the researcher to ask more specific questions about what was written in the journals.

After obtaining IRB approval from both the research institution (Appendix A) and the school district (IRB Approval #2326-2), the researcher met with the principals to review the Letter of Intent (Appendix B) and Journal Prompts and Protocols (Appendix C). This whole-group meeting ensured a uniform message. Principals were informed of how data for the study would be collected. Principals were also informed that their participation was voluntary and that they could choose to stop participation at any time or could choose not to respond to any journal request or interview question. They were informed that their decision to participate, or not to participate, in this study would have no effect on their employment status in the district. Confidentiality was assured; pseudonyms have been used for all principals' and schools' names. With consent established for all participants, journal data was collected for eight months, with interviews in the following months (Figure 1). Data was collected for the majority of the school year, which included the professional development principals engaged in leading up to device deployment and four months of technology and pedagogy implementation with students in their schools. Thereby, the experience of leading change during early implementation of the 1:1 initiative was captured.

Figure 1

Data collection timeline

Journal protocols and procedures. Beginning in May 2014, principals were asked

to keep a journal on the private wiki, completing submissions at least once by the end of

each month. This enabled real-time insight into the principals' experiences. The journal

prompts were developed based upon the conceptual framework. In each journal,

principals were asked to reflect on their experience leading the 1:1 initiative in their

building, specifically considering that experience in terms of pedagogy, technology, and

change (Fullan, 2013). The specified definitions of change, technology, and pedagogy

were based upon the literature review (Bridges, 2004; Fullan, 2007; Fullan, 2013; ISTE,

2012; Marzano et. al, 2005, Rogers, 2003). The protocol asked that they reflect on and

include any contexts or situations that they believed were influencing their experience.

The prompt explained:

> In each journal, please reflect on your experiences leading [the program] in your
>
> building, including any contexts or situations that you believe are influencing
>
> your experience. When you reflect, consider all aspects of [the program],
>
> including pedagogy, technology, and change. Use the following definitions as a
>
> guide:
>
> - PEDAGOGY: The art and science of teaching. Key concepts: opportunities to
>
>   learn differently, learning how to learn, constructivism, learner-centered
>
>   environments.

- TECHNOLOGY: The use of digital content and digital tools to enhance learning. Key concepts: expanding storehouses of information, ubiquitous access, tools for collaboration.

- CHANGE: The process through which innovations are adopted and schools are recultured. Key concepts: initiation, implementation, institutionalization, cognitive and affective change

They were also welcomed to include any general reflections that they did not associate with one of the three journal prompts. These prompts facilitated description of how they viewed these components as part of the phenomenon.

Each month, the researcher sent an email communication to the principals reminding them to submit their journal entry. After the first month, an individual email was sent to each principal thanking them for their participation and providing written feedback on the relevance of their response to the prompts. For example, principals who focused on the experience of their teachers rather than their own experience were reminded that the purpose of this research was to understand their personal beliefs, attitudes, and needs. During each of the next five months, a group email was sent with a "friendly reminder" to submit a journal entry. In the sixth month, individual emails were again sent to each principal. The journal responses had become very broad and the data suggested that the participants were losing sight of the focus and intentions of the research. Therefore, each principal was provided with additional, more specific prompts to help them reflect on their experience; the initial prompts were never abandoned. Based upon the journals submitted, the principals were provided at least three of the following prompts, each of which reflects the intent of the research questions:

- How do you view your role in leading these changes? What do you see as your responsibilities?

- How have you promoted/supported these changes?

- What are your reflections on what you have done and want to do as a leader?

- What are your needs as a leader to keep the momentum going?

- What challenges have you faced and what successes have you seen? How have you responded as a leader?

In the eighth month, December 2014, a group email was sent notifying principals that it would be the final month for journal reflection. This email also notified principals that the researcher would send a follow-up email to arrange a time for an interview.

Interview protocols and procedures. Semi-structured interviews were conducted by the researcher in the spring of 2015. In this role, I elicited specific information from participants while maintaining a conversational atmosphere. Moustakas (1994) recommended a general interview guide as a way of probing for meaning in the participants' experiences, and the sample questions provided by Moustakas were used as the basis for the interview protocol (Appendix D). Two questions on the interview protocol were developed to specifically align with the conceptual framework. These questions asked principals to reflect on specific ISTE*A standards that illustrate the synchrony of pedagogy, technology, and change knowledge:

- The ISTE A standards state that the principal should "*Inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital-age resources to meet and exceed learning goals, support effective*

instructional practice, and maximize performance of district and school leaders."

Can you comment on this standard in light of your experience? Do you see your

experience as reflective of this statement?

- The ISTE A standards also state that the principal should "*Lead purposeful*

  change to maximize the achievement of learning goals through the appropriate

  use of technology and media-rich resources." Can you comment on this standard

  in light of your experience? Do you see your experience as reflective of this

  statement?

The alignment between the two standards indicated in these questions and stratosphere

was based on the development of the discipline specific framework, which is discussed

later in this chapter.

Perry's (2013) transcendental method for research with human subjects was also

consulted. Perry (2013) provided a framework for developing questions that address the

cognitive operations associated with experience: immediate context, situational context,

and developmental context. Questions of immediate context relate to individuals

responses and decision regarding their experience (Perry, 2013). Questions that explore

situational context relate to other influencing factors that relate to an experience, such as

cultural or political issues (Perry, 2013). Questions related to developmental context

reveal how the experience has shaped the individual's personal development (Perry,

2013). Interview questions crafted around these three contexts elicit insight into

multidimensional nature of the experience.

In addition to the interview protocol, specific questions were designed for each

participant based on the content of his or her journals. Unstructured prompts (Merriam,

2009) were used to gain in-depth understanding. These unstructured prompts were a natural outgrowth of the conversation with each participant.

Each interview took place at the principal's school. All interviews began with an opening statement indicating that participation was voluntary, and that the goal of the interview was to gain deeper insight into his or her experience. The opening statement emphasized my understanding that they may find it challenging to talk about themselves, as experience tells us that good leaders focus on their constituents. I stressed that for this interview, it was important to focus on their personal experience, thoughts, and feelings. The interview protocol was used to guide the conversation, but as a semi-structured interview, their order and phrasing was modified based on the participant's responses. All interviews were recorded and transcribed. Recordings and transcriptions were stored on my personal computer as well as on a back-up drive.

Interview pilot. Prior to interviewing the participants, the interview protocol was piloted with the principal who was excluded from the study due to insufficient data. This principal only submitted one journal, and was therefore considered to be an excellent pilot subject for the interview protocol. The principal was informed that participation was voluntary. The interview was recorded and the recording was saved on my personal computer as well as on a back-up drive. This pilot allowed me to refine the interview protocol and guiding questions to be used during the formal interview based data collection process.

Role of the Researcher

In qualitative research, the researcher is the primary instrument in data collection and analysis (Creswell, 2013; Merriam, 2009; Moustakas, 1994). Merriam (1994)

identifies advantages to the human instrument, which include the ability to be responsive and adaptive, to use nonverbal and verbal communication, and to clarify, summarize, and probe responses. The human instrument is, however, also subjective (Creswell, 2013; Merriam, 2009; Moustakas, 1994). To reduce these subjectivities, Moustakas (1994) recommends the Epoche process.

Epoche. Phenomenology emphasizes Epoche as the first step in data analysis, where the researcher makes a conscious effort to clear his or her mind and remove all preconceived notions and biases so that descriptions of experiences can be viewed purely as phenomenon (Moustakas, 1994). This includes any ideas "that have been put into our minds by science or society, or government, or other people" (Moustakas, 1994, p. 86). This is also referred to as bracketing, as the world within the bracket, the research, is approached with prior knowledge and beliefs set aside so that the participants' experiences are the focus (Creswell, 2013; Moustakas, 1994). The Epoche makes the researcher naïve and open, and gives the researcher fresh vision in order to perceive new ideas, feelings, and understandings (Moustakas, 1994).

The Epoche process is challenging. It requires time, patience, and concentration (Moustakas, 1994). Moustakas (1994) suggests two processes for Epoche. First, Moustakas (1994) recommends presuppositionless observation through repeated cycles of finding a quiet place; focusing on the context; acknowledging current preconceptions, thoughts and feelings; and clearing of mind. Second, Moustakas (1994) recommends reflective-meditation, where the researcher becomes consciously aware of preconceptions and creates a list of those preconceptions. The list is reviewed until the researcher feels an internal sense of closure and a readiness to suspend all biases and presumptions.

To develop my own list of preconceptions, I began by recognizing my own experiences and beliefs about leadership. As a leader who has implemented changes, although not of this specific scope or nature, I come to the study with certain conceptions of leadership. I believe that effective leaders create cultures of collaboration and collegiality around professional learning. Effective leaders are able to articulate the vision for change, generate stakeholder buy-in, and maintain motivation during the challenging change process. I also believe that not all effective leaders are effective change agents. Some leaders may be effective managers, and may provide strong instructional leadership, but may lack the courage to challenge the status quo. I also have preconceptions about this specific program because of my role in the school district that provides the setting for this study. I am a central office administrator, and my responsibilities include ensuring that curriculum development aligns with the school system's priorities and that the implementation of the learning management system is aligned with the vision for technology integration. I believe that the principal should support the district initiatives and strive to implement the program with fidelity. Through reflection on my preconceptions, I developed my participant researcher statement (Appendix E). Upon further reflection, I composed a detailed series of statements that reflected my beliefs about 1:1 computing, the role of the principal, effective leadership, and successful change processes (Appendix F).

Throughout this research, I made conscious efforts to set aside my beliefs and preconceptions, and engaged in Epoche through presuppositionless observation and reflective-meditation. It was necessary for me to bracket any preconceived notions of the change process and its influencing factors, as well as the actions and experiences of

leaders in order to truly understand the unique and collective experiences of the principals in this context. Prior to each interview, I returned to my participant researcher statement and bracketed my prior knowledge and experiences so as not to influence the interview (Moustakas, 1994). Being cognizant of my preconceptions enabled me to redirect my own thinking on occasions when, during the interview, I found myself expecting certain responses to questions. When this happened, I refocused on open-ended prompts and stopped pursuing the specific line of questioning.

I also repeatedly returned to my participant researcher statement throughout each stage of data analysis. Prior to beginning data analysis, I engaged in the Epoche process so that I could approach the data with fresh eyes. I engaged in presuppositionless observation and reflective-meditation at the start of each stage of data analysis, as well as within each stage when I was returning to the task after a break. As analysis formed into results, I reflected on my participant researcher statement and list of preconceptions in light of my findings to ensure that my own beliefs were not inhibiting me from gaining a fresh perspective. This self-reflection and bracketing enabled me to see how principals experience change leadership in the context of a 1:1 computing program.

Data Analysis

Data analysis followed Moustakas' (1994) modified Van Kaam method. This method contains seven steps across the three stages of phenomenological reduction, imaginative variation, and synthesis of meanings and essences (Figure 2). Using this method, individual textural and structural descriptions, composite textural and structural descriptions, and an essential description synthesizing composite textural and structural descriptions were composed. The final analysis presents composite themes that reflect

the principals' shared experience leading change in a 1:1 computing initiative and a statement of the essence of the experience.

Figure 2

Three stages and seven steps in phenomenological data analysis.
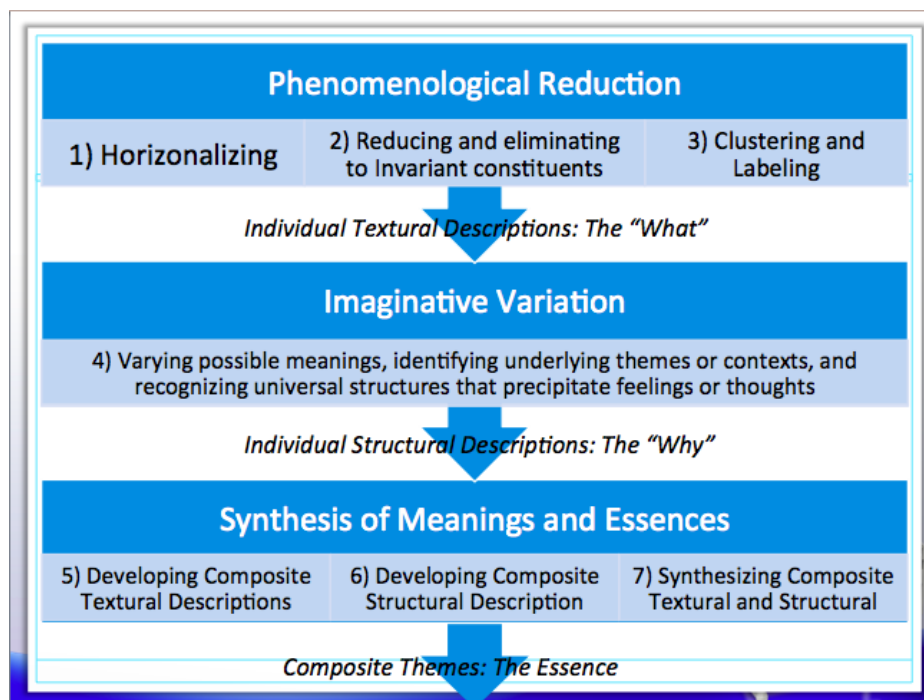
The data analysis process began with phenomenological reduction. Phenomenological reduction requires "prereflection, reflection, and reduction, with concentrated work aimed at explicating the essential nature of the phenomenon" (Moustakas, 1994, p. 91). Prior to beginning data analysis, I engaged in the Epoche process to suspend my preconceptions. Step one of analysis began with multiple passes through the data. Through this examination of the data, I identified significant statements that illustrated the participants' experience and each was given equal value. Moustakas (1994) referred to this process as horizonalizing. In step two, each expression was evaluated based upon two criteria: "Does it contain a moment of the experience that is a necessary and sufficient constituent for understanding it?" and "Is it possible to abstract

and label it?" (Moustakas, 1994, p. 121). Based on this evaluation, irrelevant, repetitive, or overlapping statements were removed. This provided for reduction and elimination to determine the invariant constituents. In step three, the invariant constituents were then clustered and labeled.

The next stage of the process, imaginative variation, uses the researcher's imagination to view the experience through different frames of reference and perspectives (Moustakas, 1994). Imaginative variation, step four, is achieved by systematically varying the possible meanings, identifying underlying themes or contexts, and recognizing universal structures that precipitate feelings or thoughts, such as time, space, and relationships (Moustakas, 1994). Following Moustakas' (1994) description of imaginative variation, I began this process with reflection on and re-reading of the individual textural descriptions. Individual textural descriptions were compared and analyzed by the researcher to explore the unique textures of each person's experience. Data was reorganized in order to understand the phenomenon. I applied a discipline specific framework, noted below and discussed in the literature review, to understand and describe the experience. Invariant constituents were validated, and any incompatible or non-explicit invariant constituents were deleted.

This process of phenomenological reduction and imaginative variation was conducted first with the journal data. This enabled the journal analysis to inform the semi-structured interviews. Once interview data was collected, the process was repeated. Steps one through three were completed for the journals; then, both data sources were combined to construct individual textural descriptions. These textural descriptions, or noemic accounts, described what principals experienced. Next, step four was repeated

with the interview data. Again, both data sources were combined. Individual structural descriptions, or noetic accounts, were composed describing why, according to the discipline specific framework, the principals experienced what they did.

The final stage was the synthesis of meanings and essences, which culminated in an essential description that integrated the textural and structural descriptions. Moustakas (1994) explains, "The fundamental textural-structural synthesis represents the essences at a particular time and place from the vantage point of an individual researcher following an exhaustive imaginative and reflective study of the phenomenon" (p. 100). In step five, I identified similarities in the individual textural descriptions to develop a composite textural description. Then, in step six, I analyzed and described these similarities in the context of the discipline specific framework, resulting in a composite structural description. Step seven, the final step, synthesized the composite textural and structural descriptions into a composite theme that illustrated the common experience of the participants. This synthesis reflected the essence of the experience.

Discipline specific framework. The discipline specific framework applied during data analysis is a synthesis of Marzano et al. (2005), the International Society for Technology in Education Standards for Administrators (ISTE, 2012), and Fullan (2013). Marzano et al. (2005) provided insight into the principal's role, identifying responsibilities for second order change derived from their meta-analysis of leadership research. The ISTE*A standards address the role of the principal in digital age leadership. They are supportive of one another, reinforcing common themes such as visionary leadership, distributed leadership and learning communities, and also are complementary of one another, providing additional insights and perspectives into change, pedagogy, and

technology. Independently, neither is sufficient for analyzing the complex experience of a principal leading a 1:1 initiative; however, when combined, they support an understanding of the principals' role in achieving stratosphere (Fullan, 2013)—the synchrony of change knowledge, technology, and pedagogy to transform schools.

To develop this framework, each of the leadership responsibilities for second order change identified by Marzano et al. (2005) and the ISTE*A (2009) performance indicators were analyzed and aligned with the concepts of change knowledge, technology, and/or pedagogy. Research in change theory and technology leadership informed the definitions of those concepts and the analysis of the responsibilities and performance indicators (Bridges, 2004; Fullan, 2007; Fullan, 2013; ISTE, 2009; Marzano et. al, 2005, Rogers, 2003). The framework is presented in the Matrix of Responsibilities and Standards Aligned within Stratosphere (Appendix G).

The creation of this framework confirmed that both the leadership responsibilities identified by Marzano et al. (2005) and the ISTE*A standards are necessary components of a framework for research on leadership in a 1:1 computing environment. None of the responsibilities for second order change identified by Marzano et al. (2005) are specific to technology, so the ISTE*A standards are needed to provide that perspective. Both Marzano et al. (2005) and ISTE*A (2009) reflect the importance of pedagogy and change knowledge. The strength in using both Marzano et al. (2005) and ISTE*A (2009) is that the resulting framework reflects all three facets of stratosphere (Fullan 2007).

The framework is not without its limitations. One limitation is that pedagogy is represented by only eight of the twenty-eight responsibilities/standards. In contrast, technology, although only reflected in ISTE*A, is represented by nineteen standards.

Change, which is reflected in both the responsibilities for second order change and the ISTE*A standards is reflected in nineteen as well. Although the combination of the responsibilities and the standards provides a more complete model, it is not a balanced representation of stratosphere. Additionally, none of the responsibilities for second order change and only two of the ISTE standards reflect the synchrony of pedagogy, technology, and change knowledge called for in stratosphere. This phenomenological research provides insight into how these responsibilities and standards do or do not reflect the actual experience of principals in this specific context. As Fullan (2007) explains, "An understanding of what reality is *from the point of view within that role* is an essential starting point for constructing a practical theory of the meaning and results of change attempts" (p. 155).

Credibility

The use of two data sources and two means of data collection contributed to the credibility of the data. Data was collected first through journals, and second through semi-structured interviews. Horizons and themes that emerged in the journals were cross-referenced with the themes that emerged from the interviews in order to confirm findings.

Measures were also taken to ensure credibility of the data analysis. Respondent validation was employed to ensure credibility. Each principal was given a copy of his or her textural description and provided opportunity to comment. In eliciting participant validation, each participant was reminded of the purpose of the research and the research questions. They were informed that only the most relevant details from their journals and interviews would be included in the descriptions, and that not everything in the description may be published. All of the participants reviewed their data and validated

that it was accurate. Most responded with no changes necessary, and a small number requested corrections in wording to more accurately reflect their experiences. The use of respondent validation is consistent with Moustakas' (1994) recommendations to engage with others to find new meanings, thereby building "more accurate and complete layers of meaning" (p. 95). Revisions were made to the textural descriptions before moving into the next phase of data analysis. This ensured accuracy, from the perspective of the person living the experience, of the noemic account prior to constructing a noetic account.

Also critical to ensuring credibility of the study was the continuous recognition of my preconceptions and biases. Prior to each interview and at each step of data analysis, I engaged in the Epoche process. In this process, I returned to my participant researcher statement and list of researcher preconceptions in order to bracket out my prior knowledge and experiences.

Limitations

Several limitations must be considered relative to these results. This study is limited in its transferability due to its narrow scope. The setting was a large Mid-Atlantic school district in the early implementation stages of a five-year plan for a system-wide instructional digital conversation. Because this was a district-wide initiative and part of the district's master plan, the participants received intensive professional development. In their journals and interviews, the principals spoke to the impact of the district plan, the district provided professional development, and the organizational culture. Therefore, this study reflects the phenomenon of leading change in this specific context, and findings may not be transferrable to other settings.

The means of identifying the participants also presents a limitation. Convenience sampling was used to identify the participants. The school system identified ten schools to pilot device implementation and instructional changes. Of the ten, eight participated in this study. All but one of the principals in this study applied to become a part of the pilot. This included a written application and a demonstration of teacher support. Participants may have had specific traits or prior experiences that made them desirable choices to lead the 1:1 initiative. Therefore, the findings in this study may not be transferrable to other settings wherein the principal did not have a choice in implementation, or where teacher buy-in is low.

Finally, as a participant researcher, I may be seen as a limitation in this study. I bring my own biases and assumptions to the study, and must recognize their impact. Every effort was made to bracket my preconceptions, and participant validation of the individual textural descriptions helped address biases and credibility.

Summary

This study employed a phenomenological method to build an understanding of principals' experience in leading the changes associated with a 1:1 initiative and the contexts or situations that influence those experiences. Phenomenology was identified as the most appropriate methodology, as the research aims to understand a highly emotional human experience that had not yet been explored. The research was conducted in a large Mid-Atlantic school district with a convenience sample of eight principals identified by the district to lead the pilot for the 1:1 initiative. Data was collected through journals and interviews during the early initiation phase of the pilot. Data analysis followed a modified Van Kaam method, informed by a discipline specific framework based upon Marzano et

al. (2005), the International Society for Technology in Education Standards for Administrators (ISTE, 2012), and Fullan (2013). The final analysis presents composite themes that reflect the essence or common experience of the participants. Multiple data sources, respondent validation, and the researcher's engagement in the Epoche process ensured credibility of these findings.

CHAPTER IV: RESULTS

The purpose of this study was to build an understanding of principals' experience in leading the changes associated with a 1:1 initiative and the contexts or situations that influence those experiences. This study, set in a large Mid-Atlantic school district, explored the beliefs, attitudes, and needs of eight elementary school principals in order to derive an essence of what it means to lead change in these environments. By focusing on the principals' collective experience, this study uncovered the phenomenon of change leadership in a 1:1 initiative.

One central question and several focused sub-questions guided this research. The central question driving this study was:

- What is the experience of principals leading change in a 1:1 computing initiative?

Three sub-questions clarified the intent of the investigation by defining the meaning of "experience" in this study. The sub-questions were:

- How do principals view their role and responsibilities in leading change in a 1:1 initiative?

- How do principals promote change in their schools in a 1:1 initiative? and

- How do principals' respond to successes and challenges in a 1:1 initiative?

Because the aim of this study was to examine the collective experience, results are presented as composite descriptions. The research questions provided the framework for individual analyses, and are reflected in the composite descriptions.

In this chapter, a principal and school profile is provided for each participant. These profiles provide insight into the uniqueness of each individual's context. Next, the

process used to develop the individual textural and structural descriptions is explained

using examples from that analysis. Then, the composite textural description is provided,

which discusses "what" the principals experienced. Composite themes are presented next,

followed by a final synthesis of the essence. The research questions are discussed lastly

making connections between the focus of inquiry and the results of analysis. This chapter

is organized into seven sections: principal and school profiles, development of individual

textural and structural descriptions, synthesis of meanings and essences, composite

themes, final synthesis: the essence, research questions, and summary.

Principal and School Profiles

The setting of this study was a large Mid-Atlantic school district serving more

than 108,000 students and more than 18,000 employees, nearly 9,000 of which are

teachers. The school system is geographically diverse, with 174 schools throughout

urban, suburban, and rural areas. There is also great diversity in the student population: it

is a majority minority system, with 51.5% of its students of Asian, African American, or

Hispanic/Latino descent.

Convenience sampling was used to identify the participants. The school system

identified ten schools to pilot device implementation and instructional changes. The

schools reflect the geographic and socioeconomic diversity of the district, and one

represents a unique case, as it was already a lab school. One principal was excluded from

this study because he resigned mid-year, and one principal was excluded due to

insufficient data. The participants in this study were eight of the ten elementary school

principals leading the school system's pilot for the 1:1 initiative.

In the following sections, profiles are provided for each principal and school. These profiles provide insight into the diversity of the individual settings, and illustrate how each of the eight participants experienced the phenomenon in a distinctive context. Pseudonyms have been used for all participants and schools. A quantitative representation of this data is presented in Table 4.

Russell: Eisenhower Elementary School. Russell was the principal of Eisenhower Elementary School. Russell was soft-spoken and reserved. He had been in education for 17 years at the time of this study. Russell was promoted to principal four years ago, and Eisenhower was the only school where he had been principal. Eisenhower served a working-class community in a southern area of the school district. Eisenhower was one of the oldest schools in the district. The historic building created an interesting juxtaposition with the modern technology.

School profile data indicated that 378 students attended Eisenhower Elementary in the 2013-2014 school year. The majority of the students were white (58%), 29% were African American, 8% were Two or More Races, 4% were Hispanic or Latino, and 1% were Native Hawaiian or other Pacific Islander. Nearly three quarters of the school's population received Free and Reduced Meals (73%). No students were identified as Limited English Proficiency. With regard to instructional services, 10% received special education services and 17% received gifted and talented services. The instructional staff at the school ranged in experience from under two years to 30 or more, with the majority having less than five years of experience.

Tiffany: Lincoln Elementary School. Tiffany was principal of Lincoln Elementary School. She was energetic; she spoke quickly and with excitement. Tiffany

had been in education for 15 years at the time of this study, and had been principal of Lincoln for five years. Lincoln was the only school where Tiffany had been principal. During those five years, the school district recognized Tiffany for her work at this school, and she received accolades from the superintendent for her leadership. She was eager and willing to invest herself and her staff in multiple initiatives simultaneously. Lincoln served a small community on an urban border where transiency was high. Lincoln was a community center where parents could come to use technology that they did not have access to at home.

School profile data indicated that 500 students attended Lincoln in the 2013-2014 school year. The school was majority-minority, with 90% of its students Black or African American, 4% Hispanic/Latino, 3% White, 2% Two or More Races, and 1% Asian. The school was in a high-poverty area, as indicated by 84% of its students receiving Free and Reduced Meals. With regard to instructional special programs, 22% of students were identified as Gifted and Talented, 10% as Special Education, and 2% as Limited English Proficiency. Lincoln was unique from other schools in this study as it was an Arts & Science magnet school, so students from outside of the school's zone could apply to attend there and receive an instructional program with that focus. The instructional staff at the school ranged in experience from under two years to 29 years, with the majority of staff having between six and 20 years of experience.

Table 4

Demographic data by school

Principal/ School	Russell/ Eisenhower	Tiffany/ Lincoln	Dottie/ Jefferson	Ann/ Kennedy	Lisa/ Washington	Gerald/ Roosevelt	Brian/ Truman	Carol/ Reagan
Years Experience	17	15	34	44	25	26	11	33.5
Years Principal	4	5	15	16 total; 6 at Kennedy	3.5	6	0	4
# of Students	378	500	501	434	444	708	483	623
White	58%	3%	1%	82%	80%	53%	54%	32%
Black/ African American	29%	90%	88%	12%	3%	19%	23%	49%
Hispanic/ Latino	4%	4%	6%	1%	7%	4%	12%	8%
Asian	n/a	1%	3%	4%	6%	18%	2%	n/a
Two or More Races	8%	2%	1%	1%	4%	5%	7%	9%
Native Hawaiian or other Pacific Islander	1%	n/a	1%	n/a	n/a	n/a	n/a	n/a
American Indian or Alaskan Native	n/a	n/a	n/a	n/a	n/a	1%	1%	2%
FARMS	73%	84%	68%	12%	6%	31%	79%	80%
LEP	n/a	2%	4%	3%	2%	6%	6%	2%
GT	17%	22%	2%	18%	40%	17%	12%	16%
SPED	10%	10%	12%	18%	8%	9%	12%	15%
Staff Experience (Mode)	2-5 years	6-10	6-10 & 11-20	2 to 5	11-20	11-20	11-20	6-10

Dottie: Jefferson Elementary School. Dottie was the principal of Jefferson Elementary School. She had been in education for 34 years at the time of this study, and had been principal of Jefferson for 15 years. Dottie was a spirited and energetic individual. She always wore a broad, genuine smile. Dottie enjoyed telling stories of what she saw in classrooms and was willing to talk at length about her experiences. Jefferson was the only school where Dottie had been principal. The school served a small, well-established suburban community in a western area of the district.

School profile data indicated that 501 students attended Jefferson in the 2013-2014 school year. The school was majority-minority, with 88% of its students Black or African American, 6% Hispanic/Latino, 3% Asian, 1 % White, 1% Native Hawaiian or Other Pacific Islander, and 1% Two or More Races. 68% of students received Free and Reduced Meals. With regard to instructional special programs, 12% received Special Education services, 2% of students were identified as Gifted and Talented, and 4% as Limited English Proficiency. Jefferson was unique from the other schools in this study as it was a technology magnet school, so they had extensive, district provided, access to technology prior to becoming a pilot school for the 1:1 initiative. The instructional staff at the school ranged in experience from under two years to 30 or more years, with the majority of staff having between six and 20 years of experience.

Ann: Kennedy Elementary School. Ann was the principal of Kennedy Elementary School. Ann had a kind and genuine disposition. She had been in education for 44 years at the time of this study, and had been a principal for 16. She had been principal of Kennedy for six years. During those six years, the school district recognized Ann for her leadership at Lincoln, and she received accolades from the superintendent.

Her experience was evident when she spoke. She was measured and thoughtful in her comments. Kennedy served families in a large northern area of the school district with a well-established and affluent community.

School profile data indicated that 434 students attended Kennedy in the 2013-2014 school year. The students were predominately White (82%); 12% were Black or African American, 4% were Asian, 1% were Hispanic/Latino, and 1% were Two or More Races. With regard to enrollment in special programs, 18% of students received Special Education services, 18% were identified as Gifted and Talented, 12% received Free and Reduced Meals, and 3% were Limited English Proficient. The instructional staff at the school ranged in experience from under two years to 30 or more years, with the majority of staff having less than 11 years of experience.

Lisa: Washington Elementary School. Lisa was the principal of Washington Elementary School. Lisa was an energetic leader, and she was affable in conversation. She had been in education for 25 years at the time of this study. Lisa was promoted to principal three and a half years ago, and Washington was the only school where she had been principal. Washington was the community center in a small, affluent neighborhood of attached brick homes in the central region of the school district. Although the area was densely populated, the neighborhood had a park-like atmosphere. The community it served was so small that no busses were required; all of Washington's students walked to school or were dropped off by parents.

School profile data indicated that 444 students attended Washington in the 2013-2014 school year. The majority of the school's students were white (80%); 7% were Hispanic/Latino, 6% were Asian, 4% were Two or More Races, and 3% were African

American. Only 6% of students received Free and Reduced Meals, only 8% received Special Education Services, and only 2% were identified as Limited English Proficiency. In contrast to those small subgroups, 40% of students were enrolled in the Gifted and Talented program. The instructional staff at the school ranged in experience from under two years to 30 or more, with the majority having between 11 and 29 years of experience.

Gerald: Roosevelt Elementary School. Gerald was principal of Roosevelt Elementary School. He had been in education for 26 years at the time of this study, and had been a principal for six. Gerald had a commanding presence with a friendly personality. He was candid and outspoken with regard to his experiences and his beliefs. Roosevelt was the only school where Gerald had been principal. The school served a well-established, largely middle-class community in an eastern area of the district.

School profile data indicated that 708 students attended Roosevelt Elementary in the 2013-2014 school year. The majority of the students were white (53%), 19% were African American, 18% were Asian, 5% were Two or More Races, 4% were Hispanic or Latino, and 1% were American Indian or Alaskan Native. With regard to enrollment in special programs, 31% received Free and Reduced Meals, 17% were identified as Gifted and Talented, 9% of students received Special Education services, and 6% were identified Limited English Proficient. The instructional staff at the school ranged in experience from under two years to 30 or more years, with the majority of staff having six to 20 years of experience.

Brian: Truman Elementary School. Brian was the principal of Truman Elementary School. He was easy-going and good-humored. Brian had been in education for 11 years and he was a first year principal at the time Truman became a pilot school

for this initiative. As a first year principal, Brian was dedicated to learning more about the community and getting to know the stakeholders. Brian would often be seen in front of the school at openings and dismissals, talking with parents. Truman was in the southern area of the district on an urban border. Despite its proximity to a major city, the community had more of a suburban atmosphere. Transiency was only moderate in comparison to the other urban-bordering schools in this study.

School profile data indicated that 483 students attended Truman in the 2013-2014 school year. The school's students were predominately white (54%), Black or African American (23%), or Hispanic/Latino (13%); 7% of students were Two or More races, 2% were Asian, and 1% were American Indian or Alaskan Native. The school was in a high-poverty area, as indicated by 79% of its students receiving Free and Reduced Meals. With regard to instructional special programs, 12% of students were identified as Gifted and Talented, 12% as Special Education, and 6% as Limited English Proficiency. The instructional staff at the school ranged in experience from under two years to 30 or more, with the majority having between six and 20 years of experience.

Carol: Reagan Elementary School. Carol was principal of Reagan Elementary School. She had been in education for more than 33 years at the time of this study, and had been principal of Reagan for four years. Carol had a maternal air about her, and spoke often of her family's influence on her as a professional. Reagan was the only school where she had been principal. Although in a more suburban area of the district, the small community that the school served had a more of an urban atmosphere with high transiency.

School profile data indicated that 623 students attended Reagan in 2013-2014.
The school was majority-minority, with 49% of its students Black or African American,
32% white, 9% Two or More Races, 8% Hispanic/Latino, and 2% American Indian or
Alaskan Native. The school was in a high-poverty area, as indicated by 80% of its
students receiving Free and Reduced Meals. With regard to instructional special
programs, 16% of students were identified as Gifted and Talented, 15% received Special
Education services, and 2% were identified as Limited English Proficiency. Reagan was
unique from the other schools in this study as it was already a Lab School for English
Language Arts, so they had external visitors observing instruction prior to becoming a
pilot school for the 1:1 initiative. The instructional staff at the school ranged in
experience from under two years to 29 years, with the majority of staff having less than
10 years of experience.

Development of Individual Textural and Structural Descriptions

Data was collected for the majority of the first year of implementation. This time
frame included professional development activities provided by school district leaders in
preparation for implementation of the initiative; it also captured changes in technology
and pedagogy in the schools during the first four months of the initiative's
implementation. Two methods of data collection were used: journaling and semi-
structured interviews. Journal data was collected for eight months, and interviews
occurred in the following months.

Data analysis followed Moustakas' (1994) modified Van Kaam method. This
method contains seven steps across the three stages of phenomenological reduction,

imaginative variation, and synthesis of meanings and essences (Figure 2, originally presented on p.80).

Journal analysis. At the conclusion of the journaling period, analysis began with phenomenological reduction (Figure 3). Each journal was treated individually during this stage of analysis.

Figure 3

Three steps in phenomenological reduction

Phenomenological Reduction		
1) Horizonalizing	2) Reducing and eliminating to Invariant constituents	3) Clustering and Labeling

After engaging in the Epoche process reflecting on my participant researcher statement (Appendix E) and list of biases and preconceptions (Appendix F), to ensure that my own beliefs would not affect the analysis, I examined each journal, identifying all statements of significance relevant to the research questions (Step 1). I took multiple passes through the data until no new horizons were identified. The following statements, taken from Russell's journal, provide an example of horizonalizing:

- "I will reflect on the last 3 years and how they have set the stage for the [pilot] initiative."

- "I also communicated that if they did choose to use the device this year that they were welcome to take risks and fail in their attempts without fear of retribution."

- "Most of the F2F [face-to-face] dialogue related to [the] instructional shifts has taken place in data dialogues (grade level meetings) and in post-observation conferences"

- "Conversations turned quickly, however, to how the students in grades 1-3, who would all be getting the same device, would be using the new technology. This shift in focus made me realize that I, as the principal, wanted to influence teachers' thinking and planning on how the students might use the devices."

Following Moustakas (1994) modified Van Kaam method, those horizons were re-examined collectively, and any repetitive statements were removed from the listing of horizons (Step 2). Finally, horizons were re-examined, looking for patterns in meaning. Similar statements were grouped together and assigned a label reflective of their commonality (Step 3). The following example, taken from Lisa's journal, illustrates how horizons were clustered and labeled. Each of these statements spoke to Lisa's belief that motivating teachers was an important part of her role and her responsibilities and to how Lisa's actions reflected that belief. Thus, they were labeled "Motivating Teachers."

- "I am making every effort as a leader to be supportive, cheer them on, use my own device to model the importance, and to shelter them from too much information so they don't feel overwhelmed, [especially] so early on in the process."

- "I have worked hard this year to create an environment for my teachers where they are free to fail and take risks."

- "That was all my staff needed…she is one of us, willing to help, and get our questions answered."

- "In my mind….I must keep MORALE as high as possible, I must support my pioneers."

The last step in the analysis of the journals was imaginative variation (Moustakas, 1994). Imaginative variation is the second stage and fourth step in the modified Van Kaam method of analysis (Figure 4). In this step, I looked for underlying meanings in the clustered statements through the lens of the discipline specific framework (Appendix G).

Figure 4

The second stage and fourth step of analysis

Imaginative Variation

4) Varying possible meanings, identifying underlying themes or contexts, and recognizing universal structures that precipitate feelings or thoughts
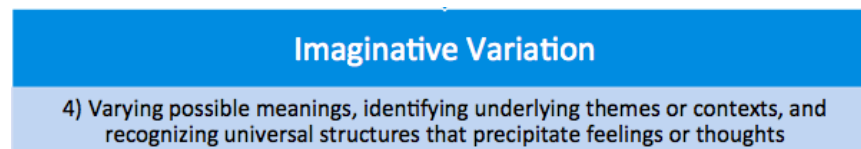
I coded each statement as reflective of the second-order change leadership responsibilities identified by Marzano et al. (2005) or ISTE*A Standards (2012). In doing so, I identified underlying themes and universal structures related to leadership. For example, the following statements, taken from Gerald's journal, were reflective of the second-order change leadership responsibility of Optimizer (Marzano, et al., 2005). Each reflects how Gerald saw setting a positive emotional tone for the change and being the driving force behind the initiative as a part of his experience and role.

- "I have provided a safe atmosphere for teachers to make changes in how and what is presented during instruction."
- "I also ensure teacher voice in what we do and how changes will be implemented."
- "Providing all information and being truthful with [my] staff lays the foundation for teachers [being] willing to take risks, use their leadership skills, and make changes at an appropriate pace."

- "I feel it very important to be in rooms and participating with students and teachers as instruction is presented. My involvement goes a long way with supporting teachers."

This journal analysis informed the semi-structured interviews. Each interview was unique, as each principal's' experience was unique. The interviews all started with a common interview protocol (Appendix D), but I also prepared questions to ask each principal based on the content of his or her journal. For example, Tiffany wrote, "I need to lead by example. I need to walk the walk." During the interview, I asked for specific examples of how she felt she did this. During Brian's interview, I asked him what he felt contributed to the change in attitude in his building, based on his statement: "Teacher questions and requests are moving from 'this doesn't work right' towards 'could we get this program to do this?' This shift from <u>limitations</u> to <u>potential</u> [underline original] is empowering and paving the way for this initiative to be successful when we move to full implementation." These questions enabled me to gain clarification as to what happened during the experience and how the principals made meaning of it.

Interview analysis. After data was collected through the semi-structured interviews, I returned to the process of phenomenological reduction (Figure 3), focusing exclusively on the interview data. I again engaged in the Epoche process prior to analyzing each interview, in order to ensure credibility in the results. I examined each interview transcript, identifying all statements of significance; this process of identifying horizons is Step 1 in phenomenological reduction. The data was evaluated multiple times until no new horizons were identified. The following statements, taken from Tiffany's interview, provide an example of horizonalizing:

- "I think this year we've really had to just manage stress of teachers."

- "We did some lesson studies, and that helped because it opened teachers' eyes to why change was so necessary, [because …] when you're in your classroom, you think everyone around you is doing the same thing."

- "I'm also in the classrooms, I'm really super hands-on, […] they know I'm evaluative, but they don't see me as evaluative […] I can walk in and they'll say, do you think this is good? How do you think this went?"

- "I think that also my role is to make the school a place where it's okay to take risks and try things."

With all horizons identified, data from the journals and the interviews were combined to create a single list of horizons for each principal. I then proceeded to the second step of phenomenological reduction, reducing and eliminating to invariant constituents (Figure 3). Repetitive statements were removed from the overall listing of horizons.

The horizons were then analyzed for patterns in meaning, and similar statements were clustered and labeled. This reflects the third step of phenomenological reduction (Figure 3). The following example illustrates this step. These example statements, taken from Ann, were clustered and labeled "Prior Experiences." The statements reflected her belief that her experience leading the 1:1 initiative did not begin when her school became a pilot school.

- "It's been a longer-than-just-this-year experience, so I think that's crucial to understand."

- "I started working with the office of technology to see what […] a standard [would] look like in any classroom. And, gradually over the first year, I started

putting things in teachers hands and getting them the training on how to use them."

- "In tandem to the technology, we worked a lot on engaging learning. What does that look like?"

- "We did a lot of trainings […] where teachers would share what they'd learned and what they had done. All that was before […] the idea of a [pilot] school. So when the opportunity came for that—that we could apply to that—what was fascinating was my staff came to me, and they said we need to apply for this."

Finally, individual textural descriptions were composed for each participant. These textural descriptions provided insight into the individual noemic accounts, or "what" each principal experienced (Moustakas, 1994). The following excerpt from Dottie's textural description provides an example result of the phenomenological reduction:

Dottie promoted change by "thinking outside the box." Dottie explained, "I was never one to worry about rules […] When you take a school from here to here, the whole staff did, no one worries about what you're doing because you're obviously doing something right. So that's the key, and I'm very frank with teachers about it." Dottie also had a constant presence in the classrooms. She felt this was critical so that she could provide feedback and acknowledge the ongoing growth of both the teachers and students. She had ongoing discussions with teachers about the choices they were making and prompted them to consider new ideas. For students, she acknowledged the decisions they were making about their own learning. She also supported teachers by saying "yes": "I say yes to a lot of stuff, because yes is

good. Yes is good for teachers, whatever it is. They don't ask for much." She

surveyed teachers to see what they need, and paid for teachers to come back in the

summer to plan for the following school year. Dottie explained, "You can't

change [pedagogy] without good staff development and support."

Understanding the individual noemic experiences was a critical step in data analysis. The

individual textural descriptions, derived from both journal and interview data, provided

the foundation for all remaining steps in analysis. Understanding the nuances in each

individual's experiences was critical in determining the composite description.

Credibility of the individual textural descriptions was confirmed by cross-referencing

horizons and themes that emerged between the two data sources, and through participant

validation. While an individual structural description was composed for each participant,

only the composite description is included in this chapter, as the aim of this research is to

understand the collective experience of leading change in a 1:1 initiative.

　　　　Imaginative variation. After composing individual textural descriptions

reflecting both data sources for each individual, I returned to the second stage and fourth

step of analysis, imaginative variation (Figure 4). Again, I engaged in the Epoche

process, reflecting on my participant researcher statement (Appendix E) and list of biases

and preconceptions (Appendix F), to ensure that my own beliefs would not affect the

analysis. During this step, I looked for underlying meanings through the lens of the

discipline specific framework, as described in Chapter 3 and included in Appendix G.

Individual textural descriptions were openly coded, and patterns of meaning were noted.

As like ideas were grouped, themes emerged for each individual, and those themes were

coded according to the discipline specific framework. Lastly, individual structural

descriptions were composed reflecting those themes. The following excerpt illustrates this fourth step in phenomenological data analysis. In this example, Carol's lived experience reflected the underlying theme of instructional leadership and the second-order change leadership responsibilities of Knowledge of Curriculum, Instruction, and Assessment as well as Monitoring/Evaluating (Marzano et al., 2005).

Carol described her primary role as that of an instructional leader. Early in implementation, Carol was concerned because she was not tech-savvy. She quickly realized that she did not have to be the expert in technology, but the expert in instruction with enough knowledge of the tools to know if it was a good or bad choice instructionally. She was in the classroom every day, seeing and listening to what was happening. She engaged in honest reflection with teachers and provided them with ongoing feedback. As instructional leader, she felt it was her responsibility to ensure that the instructional risks that were being taken were in students' best interest. She would reject activities that posed safety concerns or weren't financially feasible. She would also reject activities that were fun but lacked a focus on student achievement. Because most evidence of student learning was digital, she had to be vigilant in monitoring instruction in order to ensure that what was planned was done. As implementation progressed and she observed more student learning, she began to become concerned about the impact of the technology on early childhood literacy. She believes that reading volume matters, and wanted to be sure that students were reading enough.

Carol's experience of leading the 1:1 initiative as an instructional leader reflected the second order change leadership responsibilities of Knowledge of

Curriculum, Instruction, and Assessment and Monitoring/Evaluating (Marzano et al., 2005). Knowledge of Curriculum, Instruction, and Assessment reflected the leader's knowledge of best practices, while Monitoring/Evaluating reflects the leader's attention to the effectiveness of the school's practices and their impact on student learning. Carol has extensive knowledge of best practices, particularly as they relate to literacy. Carol applied her knowledge of best practices as she monitored and evaluated instructional practices in the school. Her regular presence in the classrooms enabled her to identify instructional issues and monitor implementation of plans. When teachers brought forward innovative ideas for instruction, she vetted them to ensure that they were in the academic best interest of students.

The individual noetic accounts examined the nuances of each individual's experience and described why, according to the discipline specific framework, the principals experienced what they did (Moustakas, 1994). Again, credibility was ensured by cross-referencing themes that emerged between the two data sources. This analysis enabled a cross-comparison of similarities and differences among the principal's experiences, and ultimately led to the essential description.

Synthesis of Meanings and Essences

The synthesis of meanings and essences was the third and final stage of data analysis (Figure 5). This stage is comprised of three steps: developing composite textural descriptions, developing composite structural descriptions, and synthsizing composite textural and structural descrptions. The end result of this analysis is the essence of the experience.

Figure 5

Three steps in synthesis of meanings and essences
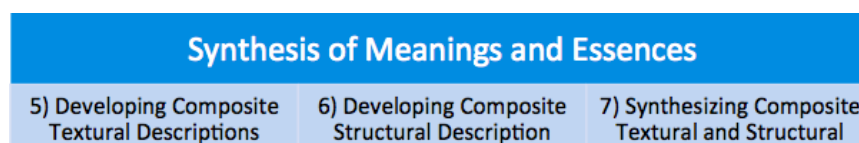
Composite textural description. The composite textural description, the fifth

step in the synthesis of meanings and essences, reflects a synthesis of each individual's

distinctly different and setting-specific experience (Moustakas, 1994). In this analysis, I

became immersed in the textural descriptions, moving back and forth between them

seeking patterns in experience. Using open coding during multiple passes through the

data, patterns emerged. Those descriptions of experiences that were common among all

eight principals were clustered and labeled into themes. As themes emerged, I returned to

my participant researcher statement (Appendix E) and listing of biases and

preconceptions (Appendix F), considering each to ensure that my own prior experiences

did not impact the description of the participants' collective experience. The final textural

description provided insight into the collective noemic account, or "what" principals

experienced. The description was divided into five themes: 1) prior experiences impacted

their leadership; 2) overall feelings about the experience were positive; 3) risk-taking was

valued, promoted, and supported; 4) instructional leadership was a key responsibility; and

5) collaboration was valued and fostered. Each is discussed in the following sections.

Theme 1: Prior experiences impacted their leadership. When asked to reflect

upon their experiences leading the 1:1 initiative, the participants in this study referred

back to experiences prior to being named a pilot school. Most participants discussed their

experience in their buildings in the years leading up to becoming a pilot school, and many

described the challenges they faced in those years. Both Tiffany and Carol encountered poor quality of instruction and toxic climates in their schools. Dottie was frustrated by student behavior that was resulting from lack of engagement. Lisa "saw inequities in the classrooms." Each of these leaders began to implement changes that would create a collaborative climate and improve the quality of instruction. The experience of overcoming challenges prepared these leaders for becoming a pilot school. Lisa explained, "I wanted [to become a pilot school] so much for them because they had worked so hard. They had thrown themselves out there to [make changes in instruction] […] I just knew that if we [became a pilot school] it would be great here."

Although Russell and Ann did not face those same sorts of challenges, they had started to implement changes in the instructional practices in their schools. Russell had begun the work of shifting instruction from teacher-centered to student-centered. Ann had set goals for her school related to engaging learning, instructional technology, and differentiation in small group instruction. Both Ann and Russell believed that these change efforts laid the groundwork for becoming a pilot school. Ann emphasized, "It's been a longer-than-just-this-year-experience […] that's critical to understand." Lisa also indicated this sentiment: "People need to understand that leading a 1:1 initiative is not a [one] year thing. It takes a lot of time."

Even Brian, who was a first year principal at the time his school became a part of the pilot, explained that his prior experiences influenced his leadership in this context. He described his lived experience as a teacher in the context of a change initiative where the staff was resistant, and his memories of the leadership in that context. Gerald spoke more personally about how his prior experiences shaped his leadership. In a prior role, Gerald

observed "the best and worst of what to expect in a school building, and […] how to handle it in a positive way or how to really muck it up." He felt this experience enabled him to predict where issues might arise in implementation.

These statements illustrate that prior experiences impacted their leadership. Although they did not realize it at the time, the process of becoming a pilot school began well before their awareness of the school district's plans to implement 1:1 computing and student-centered learning. Each of the principals believed that these prior experiences—the ways in which they lead or experienced change—directly impacted their experience leading the 1:1 initiative.

Theme 2: Overall feelings about the experience were positive. Despite some initial concerns, the participants in this study all had positive feelings about their experience leading the 1:1 initiative. Early in the initiative, some of the principals experienced self-doubt. Lisa described feeling nervous, worried, and apprehensive. She questioned, "Am I the right person [to lead this initiative]?" Yet Lisa also described her excitement as the initiative was implemented. As she saw student-centered learning coming to life in her classrooms she exclaimed, "Pinch me…is this really happening?!?!?! [punctuation original]" Carol also had some initial concerns. She felt intimidated, stating, "I am not the most tech savvy person […] I'm not the one that has the know-how to do this." Like Lisa, Carol also described her excitement, and used the word "invigorating" to describe her experience. Gerald was seeking invigoration when he applied for the school to be a part of the pilot program. He explained that he "needed something different" to "light the fire again." He found this in the experience of leading

the initiative, which he described as "refreshing," "satisfying, and "positive 90% of the time."

Veteran principals Ann and Dottie both stated that the experience was keeping them in education. Ann described it as, "one of the best journeys [she's] taken," and said that she is, "not at all ready to retire because of this." Dottie similarly stated, "I could retire, but there's no way I would." Dottie also described her 34th year as "the best year ever." The experience of the veteran principals was contrasted by the experience of a first-year principal. Brian felt a great deal of stress as he was pulled in multiple directions as a leader in this initiative and a new administrator. He was initially fearful of having guests visit his building to observe implementation. Over time, those concerns changed to feelings of pride and excitement as district leaders and fellow principals validated his accomplishments and growth.

Russell and Tiffany also expressed pride and excitement. Russell found it exciting to watch "teachers change their approach to teaching and learning," and to watch "the excitement spread throughout the community." Tiffany's excitement was evident in the way in which she talked about her school, and she described her pride in their accomplishments. It has inspired her to "amp up [her] game" as a leader.

These statements reflect feelings about how the experiences were positive. Regardless of initial concerns, motivation for becoming a part of the pilot, or years of experience, the participants found leading the 1:1 initiative to be an overall positive experience. They described becoming more confident as leaders, having implemented an initiative that challenged current models of instruction. They were excited to come to work each day and found the experience motivating.

Theme 3: Risk-taking was valued, promoted, and supported. To create change, the principals all focused on creating a culture and climate conducive to risk-taking. Most principals were comfortable with the idea of taking risks. Tiffany described her desire to make "the school a place where it's okay to take risks and try things." Dottie explained, "I was never one to worry about rules […] When you take a school from here to here […] no one worries about what you're doing because you're obviously doing something right. So that's the key, and I'm very frank with teachers about it." Russell described feeling that he was "a step ahead" in understanding technology, so he was comfortable with the risks teachers were taking. Both Carol and Ann described being comfortable with giving teachers freedom. Ann emphasized the importance of hiring good people, and then said, "Give them the tools they need […] and get out of their way and let them to do their job." Carol similarly felt it was important to "empower the teachers and get out of the way," and added, "I was comfortable with that because I had teachers I could say that with."

The principals were concerned that their teachers also felt comfortable with risk taking. They saw their role as building a culture and climate that supported risk taking. They described building the foundation for this culture by maintaining high morale, even in the face of challenges. Russell sent weekly messages to teachers that were designed to inform and inspire. Ann and Lisa both described themselves as "cheerleaders." Lisa believed, "The key to being a great leader is MOTIVATION!" To maintain morale, she tried to remain as calm as possible and hide any nervousness, recognizing that reassurance was critical in keeping momentum going. Similarly, Carol described herself as a "positive person," and said that, "positive is contagious […] I always smile. I always greet everyone […] like everything's fine, everything's great." Brian reflected that not

long into implementation, he realized his role was "more about emotional support than technical support."

Trust was also critical to building this culture of risk-taking. Gerald explained, "Being truthful with my staff lays the foundation for teachers [to be] willing to take risks." He wanted his teachers to know that he would back them up and fight for what was in their best interests. Russell recognized the importance of trust in the change process, commenting, "They are not going to take those risks or do those new things if they feel [there is going to be punitive action if] it doesn't go well." The principals all communicated this "freedom to fail" through their actions as leaders. Most principals, for example, did not participate in learning walks with their teachers. Ann explained that she found that when she did participate, "the level of anxiety [was] automatically raised." Similarly, Russell chose not to participate in the learning walks in order to facilitate "uninhibited reflection" among the teachers.

The principals also encouraged risk taking and built trust through how they viewed the observation process. The concept of "no fail" observations, as Ann described them, was common among most principals. Lisa explained that she shared with her teachers, "It's okay if we fall down and we get dirty […] observations really are actually for that." Tiffany reassured teachers that there would be no "'gotcha if you do it wrong," and described herself as "steadfast in that […] even if their lesson bombed, it doesn't necessarily mean that it's an unsatisfactory lesson." Brian explained, "I think I sent a clear message to everybody that it was not going to be right the first time, or the second time, or the third time." He was willing to "close the screen" when lessons didn't go well

and the teacher did not want the lesson written up as a formal evaluation. Brian said, "I try to put my money where my mouth is when we sit down to go over observations."

To reinforce the culture and climate conducive to risk-taking, most principals felt it was important to celebrate successes. Lisa celebrated by regularly Tweeting about what is happening in classrooms. Russell also publicly shared positive things happening with the initiative. Some principals focused on celebrating internally with their staff. Dottie celebrated external visits from corporate partners and other school districts with her staff. She explained, "Technology companies, school systems, they're choosing you. That means you, as a teacher, have your kids at a place other people need to see. And that's the height of compliment. […] I send those emails to the staff." When Carol saw a teacher take a risk during a lesson, she would applaud that teacher and share that with the grade-level team or faculty. Ann, Tiffany, and Brian all celebrated both successes and failures. Ann encouraged teachers to share their successes and failures at faculty meetings, and would cheer for both because teachers were willing to share what didn't work and learn from their failure. Tiffany created structures where teachers could voluntarily come together to share technology successes and failures, as well as a program for recognizing and sharing excellent uses of technology more formally with all staff. Brian believed that sometimes the best learning comes from the biggest failures, and emphasized the sharing of ideas among staff.

These statements reflect that risk-taking was valued, promoted, and encouraged. All of the participating principals held beliefs about the importance of risk-taking as a part of the change process in a 1:1 initiative. They valued and encouraged risk taking, and were contentious about teachers' level of comfort. They were deliberate in their efforts to

build a culture and climate conducive to risk-taking, and trust was a key component. Although the principals varied somewhat in their specific leadership actions, each perceived promoting and supporting risk-taking as a part of their role and responsibilities.

Theme 4: Instructional leadership was a key responsibility. At the same time that the principals valued, promoted, and supported risk-taking, they also shared a concern for maintaining high-quality instruction. They described beliefs and actions that aimed to balance innovation with best practices. Several principals defined this as "instructional leadership." Others described it as "facilitate[ing]" what was happening in the building or as being a "resource." Carol considered it her responsibility to ensure that risks being taken were in the best interest of children. She explained, "The staff and I have an understanding. They 'float the balloons and I pop them' but only when needed due to safety or financial reasons" or "If it's an activity that's *just* fun […] that's not acceptable […] What are they going to learn through this?" Although the principals differed in how they described this responsibility, the foundational beliefs and actions were consistent among them.

As part of instructional leadership, the principals recounted regular interaction in the classrooms with teachers and students. Dottie and Gerald felt a constant presence in the classroom was a means to provide ongoing feedback and to acknowledge growth. Gerald believed, "My involvement goes a long way with supporting teachers." Lisa connected classroom presence and feedback with responding to some teachers' resistance to instructional changes. She was willing to have difficult conversations about what she saw in order to improve practices. Similarly, Russell's continuous classroom presence enabled him to see instances of ineffective device use for instructional purposes, and he

was able to engage teachers in discussions about their practices. He reflected, "It wasn't an easy fix necessarily, but it was something that was certainly doable because we all saw the need for it to happen." Tiffany saw her continuous classroom presence as not only important to providing ongoing feedback, but also crucial to her own learning. She explained, "If I'm not in the classrooms, seeing how it actually applies to kids then […] I can't really be the expert."

Professional development was central to the principals' experience in this role. They shared the belief that professional learning would improve instruction, and that it was their responsibility to create opportunities for that professional learning among staff. Tiffany defined instructional leadership as helping teachers teach and being "the teachers' teacher." Tiffany was concerned about initiative overload for her teachers due to new standards, new curriculum, and a new teacher evaluation system, in addition to the 1:1 pilot. To address this, she developed and implemented an action research model for professional learning that reflected each of the key initiatives. Many principals saw professional development as a way to create change. Dottie saw planning meetings as an opportunity for professional development, wherein teachers learned more about standards, student choice, and technology integration. She perceived her role within those meetings as a facilitator, saying "I try to keep the questions going." Similarly, Russell described his role as "instigating continuous reflection." Carol saw providing resources and "professional capital" as part of her role. She created opportunities to send teachers to conferences and to bring experts to the school to work with teachers.

Principals also saw professional development as a means of overcoming resistance. Ann described that when she saw low levels of rigor in instruction, she

considered what professional development could help bring change. Ann explained it as, "being critical, but not in a critical way." When Brian saw that "the train [wasn't] on the track," in some classrooms, he offered "specific goals for moving forward and resources to help." Lisa maintained an awareness of who was participating in professional development, and helped teachers, particularly those who were resistant, to reflect on their goals.

These statements reflect that instructional leadership was a key responsibility. The participants perceived the role of instructional leader as significant to their experience leading the 1:1 initiative. They saw it as their responsibility to be present in the classrooms and facilitate professional development for teachers. Instructional leadership became a means through which the principals promoted change and responded to challenges in leading the 1:1 initiative.

Theme 5: Collaboration was valued and fostered. For all of the principals, collaboration was paramount in their experience. They shared a belief that collaboration was vital to their success, both within their schools and collectively as a pilot for the 1:1 initiative. Gerald explained, "You're living that experience with […] the people in the building […] They are the people that are going to be implementing this, for better or for worse, and the relationship you develop with them in term of collaborating, and sharing, and working with them […] directly affects how successful you are in rolling out a plan." Carol simply stated, "You *have* to be collaborative." Tiffany expressed, "I always look at it as a team effort." Dottie described herself as "one of the people at the table, not *the* person at the table." Lisa agreed, saying it is "very important that it's the voice of everybody here […] Not my voice, but we all collaborated together."

Each of the principals put structures into place that would foster this collaboration in their buildings. Most principals shared how they provided common grade level planning time, periodic half or full release days, and planning time across grade levels, as well as opportunities for cross-level learning walks and lesson studies. Russell described those collaborative structures as forums in which they "discussed the importance of making pedagogical changes in order to meet the needs of our learners and prepare them for a global workplace." Flexible grouping in these collaborative structures was important. Lisa explained, "This is what I love in a school. I don't want us to be homogeneously grouped. I want us to be heterogeneously grouped. Take this back to your grade level. Talk about it." Brian made physical changes in the building to support collaboration. He recognized that collaboration was being stifled because grade level teams were not all in the same location in the building. He explained, "It was a huge headache for people [to move classrooms], but if your grade level is strewn around the building, then you can't collaborate truly." Several principals created collaborative structures where teachers could voluntarily come together to share technology successes and failures, creating a connection between collaboration and risk-taking.

Each of the principals identified a network of other educators with whom they collaborated during the 1:1 initiative pilot, and who they felt were a critical part of their experiences leading change. Some were within their building. Most principals identified the school's staff development teacher as a key collaborator. In these schools, the staff development teacher's role was that of an instructional coach. These teachers facilitated professional learning in the areas of student-centered learning and technology integration. Dottie said that the staff development teacher was "inextricable with [her] experience."

Ann described her staff development teacher as "crucial" and said "she made my job a whole lot easier." Brian referred to his staff development teacher as "the core" of professional development. Tiffany shared, "There is no way we would have been as successful without [the staff development teacher]." Several principals identified their assistant principals as important collaborators. The principals valued this relationship because they supported them in day-to-day building operations while they attended to the 1:1 initiative. Other teacher leaders, such as grade level leaders and literacy coaches, were also seen as influential to their experiences.

Collaboration extended outside of the school as well. Many principals indicated that collaboration with district level from Curriculum and Instruction offices and the Department of Information Technology was influential. All of the principals felt that the learning community formed among the pilot principals was an influential part of their experience. As a new principal, Brian felt "relieved" that he had "other people to talk to about what [he] was doing and how [he] was going through it." He felt particularly reassured that the other principals had more experience than he had, and described the opportunity to collaborate with them as "invaluable." Carol said, "I know it sounds silly, but [...] just knowing there was always someone I could call and ask a question. That was important. And feeling close enough to them to ask questions." Lisa said, "I think we're a strong community, and I think I'm a stronger leader because they've made me a stronger leader." This collaborative relationship also elicited positive feelings among the principals. Dottie described feeling validated and motivated when she would receive "heartfelt" calls or messages from other pilot principals. For some, the collaborative

relationship assuaged feelings of self-doubt. Lisa, for example, said that she began to feel that "yeah, I kind of know what I'm doing."

This collaborative mentality was also evident in how the principals viewed change. They saw it as a process, and understood that it would take time. Yet, they emphasized that the whole staff would be moving forward together. Brian explained, "We're going at our pace […] we're the control group. People want a real story […] If you stop moving, I'm going to push you, but if you are stepping forward the whole time, no one can tell you that you're not moving fast enough." Ann told her staff "It's okay to be where you are, you just can't live there. Yeah, we're all moving, and so I expect you to move with us." Both Gerald and Lisa expressed their understanding that "change is hard" and transitions to new ways of teaching would be slow, but continued to push teachers to meet the vision.

These statements reflect that collaboration was valued and fostered. Collaboration permeated these principals' experiences leading change in the 1:1 computing initiative. Collaboration was foundational to how they created professional learning opportunities for their staff. They used collaborative structures to promote change. Successes were celebrated together and challenges were overcome together. In Dottie's words, collaboration was "the lifeblood of what [was] going to make this program work."

Composite themes. The composite themes reflect the sixth step in the synthesis of meanings and essences (Figure 5). This composite structural description reflects a synthesis of the individual noetic accounts of the experience, and is supported by all steps in the analysis leading up to this. The analysis of individual textural descriptions led to the identification of individual structural themes reflective of the discipline specific

framework. Those individual structural descriptions provide the foundation for this composite structural description.

In this step of analysis, I documented how the discipline specific framework was represented in each individual's structural description. A color-coded table was developed to facilitate this pursuit of composite themes (Appendix H). Patterns emerged in two ways. First, similarities between individual themes were noted. For example, Ann, Lisa, Tiffany, Dottie, and Carol's experiences all reflected the theme of "Learning as a Priority." In looking for patterns in meaning, I noted that the same responsibilities and standards manifested themselves in each person's unique experience. This uncovered that the same theme may reflect different components of the discipline specific framework, depending on the individual's experience. Second, similarities in the responsibilities and standards reflected in each individual's experience were examined. For example, all principals' experiences reflected the responsibility of Optimizer, but only Ann, Lisa, and Brian's experience reflected the responsibility of Flexibility. As themes emerged, I returned to my participant researcher statement (Appendix E) and listing of biases and preconceptions (Appendix F), considering each to ensure that my own beliefs were not impacting the analysis.

In order to maintain the focus of this research on uncovering the commonalities in experience, the composite themes are presented in relation to the leadership responsibility or standard as indicated in the discipline specific framework. In the presentation of each theme, a summary of the responsibility or standard is provided, followed by evidence of that theme seen in the collective experience of the participants. These composite themes capture the essence of the experience. It is important to note that while the discipline

specific framework includes seven leadership responsibilities for second order change and 21 standards for digital age leadership, only five common themes emerged. For example, the two ISTE*A standards identified as reflecting Stratosphere did not emerge as commonalities in the principals' experience. A discussion of those attributes of the discipline specific framework not represented in the composite themes will be presented in Chapter Five of this document.

The following composite textural description is divided into five themes: 1) fulfilling the responsibility of Optimizer, 2) acting as a Change Agent, 3) ensuring educational innovation in digital age learning, 4) facilitating and participating in learning communities, and 5) establishing and leveraging partnerships. These themes capture two responsibilities for second order change (Marzano et al., 2005) and three of the ISTE*A standards (2009, 2012). Each is discussed in the following sections.

Theme 1: Fulfilling the Responsibility of Optimizer. Change leadership in a 1:1 initiative is reflective of what Marzano et al. (2005) refer to as the leadership responsibility of Optimizer. Marzano et al. (2005) explain that in fulfilling this responsibility, principals are the driving influence for the change within the building. They inspire teachers to undertake new and challenging innovations, and demonstrate a positive attitude about the staff's ability to be successful (Marzano et al., 2005). The principal sets a positive emotional tone for the change, which inspires innovation (Marzano et al., 2005). Leaders performing the responsibility of Optimizer convey an understanding that change is challenging and takes time, and assures staff that they will provide the support and resources necessary for successful implementation (Marzano et al., 2005).

Inspiring and motivating teachers is central to change leadership in a 1:1 initiative and is consistent with the description of Optimizer provided by Marzano et al. (2005). Principals leading a 1:1 initiative have confidence in their faculties to innovate and achieve more, and urge them to reach ever-higher goals. They believe that people grow and change at different rates, and accept that people may be in different places in their change process. They accept those differences, so long as growth and learning is consistently progressing. Confidence in their faculties to implement the 1:1 initiative is often based on changes that happened in the school before implementing a 1:1 initiative. Principals who successfully create change in their schools prior to implementing a 1:1 initiative believe that their faculty is capable of change, and draw on that experience for leadership in this context. They approach change through a slow, measured implementation, which reflects an understanding that change is a process that takes time. Principals become the driving force for the change by facilitating honest, collaborative reflection and providing ongoing feedback. They provide the leadership and planning needed to keep teachers motivated and the work moving forward.

Principals leading the changes associated with a 1:1 initiative are sensitive to the emotional nature of change and are driven by a concern for teacher morale. They see themselves as influential in teacher attitudes, and believe that those attitudes will impact the initiative's success. In part, this is due to what they have learned from past experiences with/in leadership as well as their own personalities and leadership styles. To influence teacher attitudes, principals are attentive to teachers' needs. They assure them that they will back them up and fight for what is in their best interests. Successes are publicly celebrated and challenges are approached with a positive attitude. This may

mean hiding feelings of stress or frustration from the staff in order to ensure that they remain positive. By making sure teachers are comfortable in the change process, they help them see that they can attain goals that may have seemed out of reach at first.

These beliefs and leadership actions reflect the responsibility of Optimizer. Research (Marzano et al., 2005) characterizes this responsibility as being the driving influence for the change, inspiring teachers, and maintaining a positive attitude. Principals in a 1:1 initiative are focused on maintaining high morale and convey confidence in their staffs. They celebrate successes and remain positive when faced with challenges. Research (Marzano et al., 2005) also describes leaders fulfilling the responsibility of Optimizer as demonstrating an understanding that change is challenging and takes time. In a 1:1 initiative, this is illustrated by a slow, measured approach to implementation, wherein principals accept differences in the rate at which people change. To support continual growth and learning, principals facilitate open, collaborative reflection and provide ongoing feedback.

Theme 2: Acting as a Change Agent. The experience for principals leading change in a 1:1 computing initiative requires challenging current mindsets and models of instruction. To challenge the status quo, principals fulfill the second-order change responsibility of Change Agent, as identified by Marzano et al. (2005). When acting as a Change Agent, principals are willing to challenge current practices, despite the fact that there is no guarantee of success (Marzano et al., 2005). They are comfortable with uncertainty and conflict as an innovation is implemented (Marzano et al., 2005). An effective change agent fosters risk-taking and protects staff members who take risks (Marzano et al., 2005). In fulfilling this responsibility, principals are reflective,

continually considering where and how improvements can be made. They continually

consider new approaches that will improve outcomes, and support teachers in making

changes (Marzano et al., 2005).

For principals leading a 1:1 initiative, the act of challenging the status quo often

begins before implementation. Because these principals are comfortable challenging the

status quo, they often begin changing school culture and/or instructional practices soon

after they become principal. This is particularly true in cases where the school is

underperforming. Principals are mindful of their schools' cultures and climates, and are

careful not to upset the school's equilibrium so suddenly that they lose trust of the

faculty. They are also comfortable with productive conflict. When there is resistance or

dissent, they are willing to have difficult conversations that will move the work forward.

This is supported, in part, by their knowledge of their staff members as individuals. They

know how hard to push each person in making changes, and adjust their approach to

change leadership depending on the individual teacher's needs.

Principals leading change in this context balance top-down and bottom-up

approaches to change. They set ambitious goals and encourage innovation, but also work

with teacher leaders in the building to generate buy-in and share ideas. They provide the

message that instruction must continue to grow and improve, and work with staff to

consider alternatives to current models. They are attuned to what is happening in the

classrooms, and support teachers through ongoing professional learning. Professional

learning becomes an avenue through which principals challenge current practice.

Building a climate of trust and a culture conducive to risk-taking is also central to

acting as a Change Agent. Principals publicly acknowledge and celebrate those who take

risks, even if there was failure. They see modeling as an important part of the process, and take risks alongside of their staff. There is an underlying belief that great learning can come from failure. Therefore, they protect teachers who take-risks by assuring them there would be no retribution for failure. Observations take a different tone when they are "no-fail," and the discussion focuses on what can be learned from the risks that are taken. Although risk-taking is valued, the principal remains unwaveringly focused on how to improve student outcomes.

These beliefs and leadership actions reflect acting as a change agent. Research characterizes this responsibility as a willingness to challenge the status quo and a high degree of comfort with uncertainty and conflict as innovations are implemented (Marzano et al., 2005). Principals in a 1:1 initiative challenge school culture and instructional practices, and are comfortable with productive conflict during that change process. Research also describes leaders fulfilling the responsibility of Change Agent as fostering risk-taking and protecting staff members who take risks (Marzano et al., 2005). In a 1:1 initiative, principals set ambitious goals and encourage innovation. They foster risk-taking that will support those goals, and assure teachers there will be no retribution for failure. To support this culture of risk-taking, Principals in a 1:1 initiative publicly celebrating those who take risks.

Theme 3: Ensuring educational innovation in digital age learning. Principals leading a 1:1 initiative are focused on fostering innovation that will lead to higher levels of student achievement. This is reflected in ISTE*A Standard 2, Digital Age Learning Culture, which indicates that effective leaders "create, promote, and sustain a dynamic, digital age learning culture that provides rigorous, relevant, and engaging education for

all students" (ISTE, 2012) More specifically, Standard 2.a states that leaders "ensure educational innovation focused on continuous improvement of digital-age learning." ISTE further elaborates upon this in the Profiles for Digital-Age Administrators (2012), which states that principals, "work with staff to organize learning teams focused on employing a cycle of continuous improvement to advance their professional practice and student achievement through the use of digital tools."

While principals leading a 1:1 initiative are undoubtedly focused on technology integration, they never lose sight of instructional best practices. They believe that risks taken, both with technology and with creating learner-centered environments, must be for instructionally sound purposes. To ensure this focus, they maintain a constant presence in the classroom. They foster a mindset of continuous improvement, which they support by providing ongoing feedback and acknowledging growth.

Principals also aim to ensure instructional innovation through multi-layered professional development and support. They create opportunities for learning walks, lesson studies, grade level daily common planning, and periodic full or half day common planning. Each of these opportunities reflects how principals organize learning teams that focus on increasing innovation and improving instructional practices in a continuous improvement model. The collaborative nature of each of these structures reflects principals' belief that working together in a learning community can drive pedagogical change. Principals are not always involved in these meetings themselves; they sometimes make the choice to step back in order to lessen teacher anxiety and encourage more honest reflection. In cases where they choose not to be directly involved, they consistently leverage informal teacher leadership within the school to move change

efforts forward. By collaborating with teacher leaders, principals ensure that the emphasis of collaborative professional learning stays focused on instructional innovation that improves student learning.

These beliefs and leadership actions reflect ensuring educational innovation in digital age learning. The ISTE*A Standards (2012) characterize effective digital age leaders as those who promote innovation and rigor in the learning culture. Principals in a 1:1 initiative are passionate about technology integration and encourage risk-taking. As the instructional leader in the building, they ensure that risks taken are purposeful and in the interest of rigor, relevance, and engagement. The ISTE*A Standards (2012) also describe effective leaders as those who ensure educational innovation by fostering learning teams that support continuous improvement. In a 1:1 initiative, principals approach professional learning as a collaborative endeavor and emphasize continuous improvement through a multitude of ongoing, job-embedded professional learning opportunities.

Theme 4: Facilitating and participating in learning communities. A second theme emerges from principals' approaches to ensuring educational innovation in digital age learning. The experience of leading a 1:1 initiative includes facilitating and participating in learning communities. Collaboration again emerges as a core concept. This is reflective of ISTE*A Standard 3, Excellence in Professional Practice, which indicates that effective leaders "promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technology and digital resources." More specifically, Standard 3.b states that leaders, "facilitate and participate in learning communities that stimulate, nurture and

support administrators, faculty and staff in the study and use of technology." ISTE further elaborates upon this in the Profiles for Digital-Age Administrators, which states that principals, "contribute ideas and provide opportunities and resources to support learning communities for lifelong learning, leadership, and productivity."

Facilitating and promoting a collaborative culture in the building is vital in the principals' role leading a 1:1 initiative. There is an underlying belief that change is a team effort, and that learning communities are critical to supporting effective implementation. Principals make it a priority to allocate time for professional growth as a school community, and implement structures that build learning communities both vertically and in grade-level teams. By creating multiple avenues for collaborative professional learning, such as common planning and lesson studies, they facilitate school-wide discussions regarding successes and challenges with technology and new pedagogies. Although principals sometimes elect not to be directly involved in the collaborations, they often do take a hands-on approach and participate in learning communities with teachers. When they participate in collaborative planning they take the role of facilitator, asking questions and openly admitting that they do not have all of the answers. Through this, they build a culture of learning and promote lifelong learning.

Principals also participate in learning communities beyond their schools. They find the opportunity to collaborate with other principals implementing 1:1 initiatives valuable. This learning community serves multiple purposes. It offers the opportunity to discuss successes and challenges with schools implementing a similar program in their own unique context. Principals value learning from other schools about potential missteps in change leadership. They also value learning new ideas that they can implement in their

own buildings. The learning community also provides emotional support and affirmation. There is a feeling of comfort that comes from knowing there is a group of people who are in a similar situation that they can count on for advice or reassurance. In turn, the experience of participating in a learning community creates a desire to lead a learning community; specifically, there is a desire to support other principals who are beginning to implement a 1:1 initiative.

These beliefs and leadership actions reflect facilitating and participating in learning communities. The ISTE*A Standards (2012) characterize effective digital age leaders as persons who promote professional learning by both leading and participating in learning communities that examine instructional technology. Principals in a 1:1 initiative believe that change is a team effort, so they provide opportunities for collaboration and growth as a school community. They also value the opportunity to engage in a learning community with other principals leading 1:1 initiatives. The ISTE*A Standards (2012) also describe leaders facilitating and participating in learning communities as supporting lifelong learning, leadership, and productivity. In a 1:1 initiative, principals model lifelong learning by learning side-by-side with their staff. Further, they desire to facilitate learning communities for other principals in the early stages of 1:1 implementation.

Theme 5: Establishing and leveraging partnerships. Principals leading a 1:1 initiative are comfortable with uncertainty, and are honest with themselves and their staff that they do not have all of the answers. They know that strategic partnerships can support them in areas where they have needs. This is reflective of ISTE*A Standard 4, Systemic Improvement, states that effective leaders "provide digital age leadership and management to continuously improve the organization through the effective use of

information and technology resources." More specifically, Standard 4.d states that leaders "establish and leverage strategic partnerships to support systemic improvement." ISTE further elaborates upon this in the Profiles for Digital-Age Administrators, which states that principals "allocate funding and assign support personnel as needed to make effective use of technology resources to improve teaching and learning."

This theme of establishing and leveraging partnerships manifests itself differently in different principals, but the fundamental experience is the same. The partnerships in which they engage depend upon their own personally identified strengths and limitations, yet all leverage these partnerships to support their schools in implementation. They build relationships with both internal and external partners. They know who to consult, as well as when and how to leverage those partnerships. Partnerships with the school system's technology department and external technology companies, such as the company that provides the device, are leveraged to support technology implementation. Partnerships with district central office leadership, such as assistant superintendents and curriculum and instruction staff, are leveraged as well. Leveraging strategic partnerships is integral to the experience of leading a 1:1 initiative, as it enables principals to quickly reach out for help. Subsequently, change efforts move forward, morale remains high, and innovation continues.

These beliefs and leadership actions reflect establishing and leveraging strategic partnerships. The ISTE*A Standards (2012) characterize effective digital age leaders as those who identify strategic partners and use those relationships to improve the organization. Principals in a 1:1 initiative leverage both internal and external partnerships to improve teaching and learning. They understand their own personal needs and the

needs of their teachers, and consult those partners in the implementation of the 1:1 initiative.

Final synthesis: The essence. Drawing upon the work of Husserl, Moustakas (1994) states that essence is "the condition or quality without which a thing would not be what it is" (p. 100). This final step of analysis synthesizes meanings in order to identify that which is essential and universal theme in the experience. To determine the essence, I examined the composite textural and composite structural descriptions, looking for cross-cutting patterns. This final analysis revealed that collaboration is at the heart of the leadership experience in a 1:1 initiative. To echo Moustkas, without collaboration, the experience of leading a 1:1 initiative would not be what it is.

Collaboration permeates all aspects of change leadership in this context. There is a deeply held belief that collaboration is imperative to successfully challenging the status quo, so principals build a school culture around that ideal. Although they perceive themselves as the instructional leader in the building, their approach to changing instruction is collaborative. They see themselves as one voice, not the only voice, in the change efforts. Their constant presence in the classroom illustrates how they see themselves as a collaborative partner in the instructional process. Risk-taking is celebrated as a community and the principal facilitates a shared dialogue of what can be learned from successes and failures. Professional development opportunities support the creation of learning communities. Principals reinforce this collaborative ideal with the message to their faculties that while individuals may be in different places in the change process or moving at different paces, the whole staff is moving forward together. They inspire their faculty that they can achieve ever-higher goals together.

The spirit of collaboration extends beyond their schools. Principals value collaboration with other principals leading the 1:1 initiative. They learn together, celebrate successes together, and overcome challenges together. Principals also seek collaborative relationships with other district leaders and external partners. Through those relationships, they overcome challenges and build their own capacity to lead this change. There is never a sense that the principals are alone in this journey. As a result, reflections on the emotional nature of the change leadership experience are positive. Novice principals feel supported, and veteran principals feel compelled to offer more years of service. With collaboration at the heart of the experience, a desire to continue engaging in collaboration with others implementing 1:1 computing initiatives emerges.

Research Questions

To explore the phenomenon of change leadership in a 1:1 initiative, one central question and several focused sub-questions guided this research. The central question driving this study was:

- What is the experience of principals leading change in a 1:1 computing initiative?

Three sub-questions clarified the intent of the investigation by defining the meaning of "experience" in this study. The sub-questions were:

- How do principals view their role and responsibilities in leading change in a 1:1 initiative?

- How do principals promote change in their schools in a 1:1 initiative? and

- How do principals' respond to successes and challenges in a 1:1 initiative?

These questions provided the framework for individual analyses and, through the synthesis of meanings and essences, insights into these questions emerged. The following sections provide a summary of what has been presented in the findings thus far, framed in the context of each research question.

What is the experience of principals leading change in a 1:1 computing initiative? This experience is not bound by the timeline of the initiative. Principals believe that experience of leading the changes associated with a 1:1 initiative began before the pilot. Earlier change efforts lay the groundwork for implementing 1:1 computing. This is something that they are not cognizant of during those prior change efforts, but rather see in reflection upon the experience.

Leading change in a 1:1 computing initiative is also an emotional experience. Principals experience feelings of nervousness, apprehension, intimidation, and even fear. Yet it is also an exciting experience. Initial concerns give way to positive feelings of rejuvenation and pride. This is in part due to the relationships they build. They see this change as a team effort and believe that collaboration is critical to success. They build relationships with their staff and become comfortable not having answers to all questions that arise. They become lead learner in their buildings.

Collaborative relationships with other piloting principals help alleviate feelings of self-doubt and help them feel motivated, validated, and reassured. They take comfort in the fact that there are others in the same situation that can relate to what they are experiencing. Principals leading change also seek out relationships with other district leaders and partners. They identify their own strengths and limitations, and leverage partnerships to support them in implementation. They see their support network, both

inside and outside of their schools, as critical to their experience leading changes in a 1:1 initiative. The collaborative nature of the experience sparks an interest for principals in continuing this work once the official pilot is over by supporting other principals in their experience implementing 1:1 initiatives.

How do principals view their role and responsibilities leading change in a 1:1 initiative? Principals view their role as that of an instructional leader. In a 1:1 initiative, instructional leadership requires principals to maintain a balance between risk-taking and best practices. By promoting innovation with technology and student-centered learning, they challenge the status quo. Yet they remain steadfastly focused on sound pedagogy. To support this, they see it as their responsibility to engage in regular interactions with teachers and students in the classrooms. This enables an ongoing collaborative dialogue, through which they provide feedback and acknowledge growth.

A constant classroom presence also enables principals to identify professional learning needs, and they see facilitating this professional learning as their responsibility. They create opportunities for professional learning, and those opportunities are founded on collaboration. Principals assume the responsibility for putting structures into place that will support collaborative professional learning. While the structures are collaborative, fostering honest reflection among teachers, the principal may or may not directly participate. Knowing when to participate and when to back away and allow teacher leaders to step in becomes an important skill in this context.

Principals also view it as their responsibility to build a culture and climate that supports risk-taking and life-long learning. Principals see themselves as able to influence teachers' attitudes, and believe that there is a correlation between teachers' attitudes and

the initiative's success. Thus, they aim to inspire teachers and to maintain a high morale. Modeling becomes an important part of building this culture, as they take risks along with their staff. They reassure teachers through "no-fail" observations and by protecting those who take risks. Successes are celebrated together and teachers are publicly recognized for their change efforts. Thus, emotional support for teachers during the change process becomes an attribute of instructional leadership in this context.

How do principals promote change in their schools in a 1:1 initiative?

Principals see it as their responsibility to promote change in their buildings. They view changes as a process that would take time, and approach change through slow, measured implementation. Change efforts balance top-down and bottom-up approaches. They have great confidence in their staffs, so they set ambitious and ever-higher goals. At the same time, they leverage teacher leadership to spread innovation. Principals foster a mindset of continuous improvement, always emphasizing that the whole staff would move together in the change process.

Creating a culture of risk-taking is also critical to promoting change in the context of a 1:1 initiative. This begins with principals giving teachers freedom to fail. By setting into place practices of "no fail" observations, they build trust with teachers. This is supported by principals' constant presence in classrooms, through which they provide feedback. They not only acknowledge growth, but also areas of limitation. They are comfortable with productive conflict and willing to have difficult conversations with teachers when they aren't seeing change or when that change is not in students' best interests.

Being attuned to teachers' needs provides the foundation for professional learning. Principals use professional learning to promote change by challenging current practice and supporting implementation. Professional learning focuses on topics relevant to 1:1 implementation, including academic standards, student choice, and technology integration. They create a multi-layered structure of professional development opportunities, and each opportunity is collaborative in nature. This stems from principals' belief that learning communities can drive pedagogical change. Through professional learning and a continuous improvement model, principals promote change by improving instructional practices and increasing innovation.

How do principals' respond to successes and challenges in a 1:1 initiative?

Principals leading 1:1 initiatives believe that celebration is an important part of change leadership. They publicly acknowledge successes and innovation in their schools with their staffs. When either internal or external parties recognize the school as a whole, that recognition for their work is also shared and celebrated. Visitors to the school become occasions to inspire the staff. Principals remind their teachers that those visitors are there to see the excellent work they are doing. Failures are equally celebrated. There is an underlying belief that great learning comes from failure. Principals feel it is important to applaud teachers who are willing to share what did not work well, and who are willing to learn from failure. This provides a model for other teachers in innovation, and supports a culture of risk-taking. Principals' positive attitude in the face of challenges goes beyond celebrating teachers' risk taking and failures. When faced with challenges, principals stay focused on maintaining a high morale. They hide their own feelings of stress, frustration or nervousness in order to ensure that the staff remains positive.

Although principals experience some challenges with technology, the most substantial challenges they face are in personnel. They encounter resistance from teachers, sometimes overt and sometimes passive. Teachers may be either unwilling to slow to change. Principals must also manage teachers who attempt to make changes, but in doing so lose sight of best practices. In responding to both of those challenges, they remain focused on the message that instruction must continue to grow and improve. As the instructional leader of the building, principals align professional development to teachers' needs, and put into place learning structures that would bring change. They challenge teachers' thinking, encouraging them to consider alternatives to current models. Thus, in responding to challenges, principals reinforce among the faculty the sense that they are all working together towards a common goal.

Summary

This study examined the experiences of eight elementary school principals leading the changes associated with a 1:1 initiative. This study yields insight into the experience through a phenomenological method informed by a discipline specific framework based upon Marzano et al. (2005), the International Society for Technology in Education Standards for Administrators (ISTE, 2012), and Fullan (2013). The collective experience revealed that prior experiences impacted their leadership; overall feelings about the experience were positive; risk-taking was valued, promoted, and supported; instructional leadership was a key responsibility; and collaboration was valued and fostered. Analysis indicated fulfilling the responsibility of Optimzer, acting as a Change Agent, ensuring educational innovation in digital age learning, facilitating and participating in learning communities, and establishing and leveraging strategic

partnerships as composite themes. A final synthesis revealed collaboration as central to

the essence of the experience.

CHAPTER V: DISCUSSION

For nearly three decades, 1:1 computing programs have received the attention of instructional technology researchers (e.g. Baker, Gearhart, & Herman, 1990; Tierney, 1988). Early research into 1:1 computing examined teachers' change processes (Dwyer, Ringstaff, & Sandholtz, n.d.; Ringstaff, Sandholtz, & Dwyer, 1991), teachers' collegial interactions (Sandholtz, Ringstaff, & Dwyer, 1991), impacts on classroom management (Sandholtz, Ringstaff, & Dwyer, n.d.), and the impacts of student technology use (Reilly, n.d.; Baker, Gearhart, & Herman, 1993). Recent years have seen steady increase in 1:1 computing initiatives (Nagel, 2010; Richardson, McLeod, Flora, Sauers, Kannan, & Sincar, 2013), and attempts at large-scale adoption have been observed nationwide (e.g. Lowther, Inan, Ross, & Strahl, 2012; Rosen & Beck-Hill, 2012). As the number and scope of 1:1 initiatives has grown, researchers have focused largely on student outcomes. Research has illustrated that 1:1 initiatives have a positive impact on student achievement (e.g. Bebell & Kay, 2010; Dunleavy & Heinecke, 2007; Lei & Zhao, 2008), as well as on affective dimensions of learning (e.g. Bebell & Kay, 2010; Mouza, 2008). Further, because effective implementation has a direct impact on positive student outcomes, recent research has also examined best practices for implementation. Research on implementation revealed that the most effective 1:1 initiatives were characterized by learner-centered pedagogies (e.g. Mouza, 2008; Prettyman, Ward, Jauk, & Awad, 2012) and professional development for teachers (e.g. Storz & Hoffman, 2013). Further, researchers found that fidelity of implementation was a variable in the initiative's success (Bebell & Kay, 2010; Greaves, Hayes, Wilson, Gielniak, M., & Peterson; 2012).

The majority of research on 1:1 computing initiatives focuses on teachers and students, and reflects their experiences and perspectives (e.g. Dunleavy, Dexter, & Heinecke, 2007; Lowther et al., 2012; Prettyman et al., 2012; Storz & Hoffman, 2013; Spires, Oliver, & Corn, 2011). While research on technology leadership reveals that the principals' leadership directly impacts teachers' technology integration (Chang, 2012), the principal has received little attention in the context of 1:1 computing. A small body of research on 1:1 computing suggests that the principal's role in this specific context is important (Alberta Education, 2010; Greaves et al., 2012; Nash, 2009; Towndrow & Vallance, 2012), but that research fails to include the voice and experience of those principals. Research has not yet explored the principal's experience leading the implementation of a 1:1 initiative.

An understanding of the lived experience of principals leading change in a 1:1 initiative is critical. Fullan (2007) explains that many change initiatives collapse because of a failure to understand the lived experience of those involved. In the absence of that understanding, program leaders have been forced to make assumptions and generalize technology leadership and change leadership research that is not contextualized in a 1:1 initiative. We must first understand the nuances of the lived experience in this context before transferring claims regarding effective program leadership. More significantly, 1:1 initiatives serve an important role in equalizing student access to technology and curriculum and in equipping students with the 21st century skills they will need to be competitive in a global economy. The expectancy for positive student outcomes makes these initiatives high-stakes; they receive nationwide attention and the financial investment for a large-scale initiative surpasses $50 million dollars annually. We cannot

risk program failure because we fail to understand the experience of those charged with program leadership at the school level.

This chapter discusses the results of a study that examined principals' experiences in leading the changes associated with a 1:1 initiative. The chapter consists of five sections: research summary, discussion of results, recommendations, areas for future research, and conclusion.

Research Summary

The purpose of this study was to build an understanding of principals' experiences in leading the changes associated with a 1:1 initiative and the contexts or situations that influenced those experiences. This study explored the beliefs, attitudes, and needs of school principals in order to derive an essence of what it means to lead change in these environments. By focusing on the principals' collective experience, this study uncovered the phenomenon of change leadership in a 1:1 initiative.

To explore the phenomenon of change leadership in a 1:1 initiative, one overarching question and several focused sub-questions guided this research. The central question driving this study was:

- What is the experience of principals leading change in a 1:1 computing initiative?

Three sub-questions clarified the intent of the investigation by defining the meaning of "experience" in this study:

- How do principals view their role and responsibilities in leading change in a 1:1 initiative?

- How do principals promote change in their schools in a 1:1 initiative? and

- How do principals' respond to successes and challenges in a 1:1 initiative?

A phenomenological research design was used to understand and describe the lived experience from the perspectives of those experiencing it. Participants in this study were eight elementary school principals leading the pilot for a1:1 digital conversion in a large Mid-Atlantic school district. Data was collected through journals and semi-structured interviews. Data analysis was conducted using a modified VanKaam method (Moustakas, 1994). By engaging in phenomenological research with these principals, their lived experience was described and synthesized, resulting in an essential description of the shared experience.

The result of this study was a rich description of the composite themes that reflected the principals' experience leading change in a 1:1 computing initiative. First, a composite textural description indicated the commonalities in what the principals experienced; second, a composite structural description indicated themes resulting from the application of the discipline specific framework; and third, a final synthesis described the essence of the experience. The composite textural description revealed five themes:

Theme One: Prior experiences impacted their leadership;

Theme Two: Overall feelings about the experience were positive;

Theme Three: Risk-taking was valued, promoted, and supported;

Theme Four: Instructional leadership was a key responsibility; and

Theme Five: Collaboration was valued and fostered.

The composite structural description also revealed five themes:

Theme One: Fulfilling the responsibility of Optimizer,

Theme Two: Acting as a Change Agent,

Theme Three: Ensuring educational innovation in digital age learning,

Theme Four: Facilitating and participating in learning communities, and

Theme Five: Establishing and leveraging partnerships.

These themes captured two responsibilities for second order change (Marzano et al., 2005) and three of the ISTE*A standards. Together, the composite textural themes and composite structural themes provide insight into the collective experience and the underlying universal leadership structures.

The final synthesis revealed that collaboration is at the heart of the leadership experience in a 1:1 initiative, permeating all aspects of change leadership in this context. Principals hold the belief that collaboration is imperative to successfully challenging the status quo, so they build their school culture around that ideal. The spirit of collaboration extends beyond the individuals' schools. Principals value relationships and partnerships that help them move their work forward. With collaboration at the heart of the experience, principals' desire to continue engaging in collaboration with others implementing 1:1 computing emerges. Together, the composite themes and final synthesis provide insight into the collective experience and the underlying universal leadership structures.

Discussion of Results

The results of this study suggest that there are aspects of the principals' experience leading change in a 1:1 initiative that are consistent with current research in 1:1 computing, technology leadership, and change leadership. Specifically, this study supports findings in previous research on the importance of professional learning, setting expectations and supporting implementation, and collaboration. However, this study also

provides a counterpoint to current research that emphasizes the principal's role in vision setting, technology use, and technology modeling. Additionally, the results of this study offer a new perspective on the ISTE*A Standards. In this section, the results of this study will be discussed in relation to current literature. Consistencies with current research will first be discussed, followed by a discussion of counterpoints and new perspectives.

Consistencies with current research. The results of this study affirm several themes from previous findings in the fields of 1:1 computing, technology leadership, and change leadership. First, the composite textural description revealed that instructional leadership was a key responsibility (theme four). The principals in this study identified part of that role as participating in and leading professional learning, which is consistent with prior research in technology leadership (Cakir, 2012; Chang, 2012; Chang, Chin, & Hsu, 2008; Claro, Nussbaum, Lopez, & Diaz, 2012; Eren & Kurt, 2011; Levin & Schrum, 2012, 2013; Plessis & Webb, 2012; Storz & Hoffman, 2013) and change leadership (Fullan, 2014). Second, both the composite textural and structural descriptions revealed how the participants in this study implemented change. Acting as a Change Agent was central to their experience (structural description, theme two). In challenging the status quo, risk taking was valued, promoted, and supported (textural description, theme three), and educational innovation in digital age learning was ensured (structural description, theme three). These findings are consistent with previous research on change implementation from the fields of 1:1 computing (Learning Cultures Consulting, 2006), technology leadership (Afshari, Bakar, Luan, Fooi, & Samah, 2009; Cakir; 2012; Levin & Schrum, 2012, 2013; Peterson, 2014), and change leadership (Fullan, 2014). Third, collaboration, as the essence of the experience, is a common thread throughout the

composite textural and composite structural descriptions. The composite textural description speaks directly to collaboration in theme five, which states that collaboration was valued and fostered. Two composite structural themes also reveal the importance of collaboration in the experience: facilitating and participating in learning communities (theme four), and establishing and leveraging partnerships (theme five). These findings are consistent with previous research in 1:1 computing (Learning Cultures Consulting, 2006; Greaves, Hayes, Wilson, Gielniak, M., & Peterson, 2010), technology leadership (Levin and Schrum, 2013), and change leadership (Fullan, 2007, 2014; Fullan & Langworthy, 2014; Hargreaves & Fullan, 2012), which supports that collaboration is critical in the implementation of an innovation. Each of these three consistencies with current research will be discussed in the following sections.

Professional development. Research on technology leadership emphasizes the importance of professional learning and the principals' role within it. Chang et al. (2008) and Plessis and Webb (2012) identified the need for professional development as a significant challenge to technology implementation. Cakir (2012) suggested that building administrators needed to be first in their schools to engage in professional development on technology. Research also shows that teachers perceive staff development as a critical construct in technology leadership (Chang et al., 2008) and believe that the principal should develop an implementation plan that includes professional learning (Chang, 2011). Eren and Kurt (2011) and Levin and Schrum (2012, 2013) supported this idea, and suggested that the principals should be facilitators of professional learning. Research on 1:1 computing indicated that professional development for teachers was a key to successful implementation (Claro et al., 2012; Storz & Hoffman, 2013), but had not yet

explored the principals' experience with professional learning. Fullan (2014) described the role of the principal as a lead learner, developing a culture of collective learning to build teachers' professional capital.

This study illustrated that principals leading a 1:1 initiative saw professional development as central to their role leading change. They viewed it as a key responsibility in their role as instructional leaders. Tiffany, for example, described herself as "the teachers' teacher." The participants in this study shared the belief that professional learning could create change and improve instruction. They aimed to create opportunities for professional learning among staff, such as when Carol sent teachers to conferences and brought experts to the school to work with teachers. The participants in this study made it a priority to allocate time for professional growth as a school community. Through multi-layered professional development, these principals maintained a focus on increasing innovation and improving instructional practices in a continuous improvement model. Although the principals in this study did not express a perceived need to be first to learn about new technologies, as Cakir (2012) suggested, their experience did include creating plans for and facilitating professional learning for their faculties.

Implementing change. Research in 1:1 computing, technology leadership, and change leadership provides insight into how principals set expectations and support implementation, actions that support the leadership responsibility of Change Agent (Marzano et al., 2005). Learning Cultures Consulting (2006) asserts that in order to be successful, leaders of 1:1 initiatives must provide instructional support for teachers and engage in ongoing progress monitoring. Although this assertion is based on a literature

review of primarily white papers and is not refereed, research on technology leadership also supports the role of the principal and describes similar leadership actions. In Cakir (2012), teachers stated that principals needed to set expectations for technology use and support them in implementing those new practices. Levin and Schrum (2013) added that to leverage technology for school improvement, leaders must plan for change that impacts curriculum and instruction. Research also suggests that instructional leaders attend to culture, and this is of particular importance in technology implementation (Levin & Schrum, 2013). According to change leadership research, leaders must be change agents; they must build trust and foster cultures where teachers feel safe to take instructional risks (Fullan, 2014; Fullan & Langworthy, 2014). These concepts are related to transformational and distributed leadership, which focus on motivating and encouraging teachers. Technology leadership research suggests that both are effective leadership styles in technology initiatives (Afshari et al., 2009; Levin & Schrum, 2012, 2013; Peterson, 2014).

The participants in this study expressed strong beliefs about their role as the instructional leader in their buildings. Their experience was not one of mandating or quantifying specific technology uses, but rather one of setting and supporting expectations for innovation with technology, consistent with Cakir (2012). This is exemplified by Ann's statement to her staff: "It's okay to be where you are, you just can't live there." They promoted this change by creating a culture and climate conducive to risk-taking. Specifically, principals modeled what they expected of teachers by taking risks alongside their staff. They publicly acknowledged and celebrated those who took

risks, even if there was failure. The principals shared the belief that great learning can come from failure.

They also shared a concern for maintaining sound instructional practices. Carol's question, "If it's an activity that's *just* fun […] that's not acceptable […] What are they going to learn through this?" is an example of the balance sought between risk-taking and sound pedagogy. Consistent with Fullan and Langworthy (2014), trust was critical to building this culture of risk-taking. As Gerald explained, "Being truthful with my staff lays the foundation for teachers [to be] willing to take risks." To support teachers in implementing changes, the principals in this study felt it was important to maintain a strong classroom presence. This presence allowed for ongoing progress monitoring, which is consistent with recommendations made by Learning Cultures Consulting (2006). Progress monitoring enabled the principals to identify those who needed additional support.

The principals also supported teachers through the observation process. Risk-taking was encouraged through the "no fail" approach to observations. Lisa expressed, "It's okay if we fall down and we get dirty […] observations really are actually for that." Additionally, the participants in this study perceived themselves as supporting teachers by motivating and encouraging them. As Brian explained, leadership in a 1:1 initiative is "more about emotional support than technical support." These leadership actions illustrate the principals' attention to culture and provide evidence of distributed and transformational leadership, consistent with Afshari et al., (2009), Levin and Schrum (2013), and Peterson (2014).

Collaboration. Research on 1:1 computing, technology leadership, and change leadership consistently supports that collaboration is critical in the implementation of an innovation. To reach the goals of 1:1 initiatives, research suggests that effective leaders must both enable teacher collaboration (Greaves et al., 2010) and engage in collaboration across the organization (Learning Cultures Consulting, 2006). Levin and Schrum (2013) asserted that effective technology leaders collaborate to build community partnerships, and Fullan (2007, 2014) affirmed that effective change agents develop external partnerships. The aforementioned research lacked, however, the first-person perspective of the principal.

In the body of research on change leadership, Fullan (2007, 2014) emphasized collaboration as a strategy for change. According to Fullan (2014), effective change agents create collaborative cultures and focus on the group over the individual. Fullan (2014) asserted that effective leaders are district and system players who connect themselves and their teachers with other schools both inside and outside of the district with the goal of sharing expertise in order to create change (Fullan, 2014). Further, research suggests a connection between collaboration and professional learning. Fullan (2014) asserted that to lead change, the principal must build a culture of collective learning, wherein the principal develops the staff's expertise, and in turn, group learning improves the teaching capacity of individuals. Additionally, leaders may employ collaboration as a strategy for increasing observability. Observability, as defined by Rogers (2003), is the degree to which results of the change are visible to others; higher levels of observability increase the rate of adoption. These findings were not, however, in the context of 1:1 computing initiatives.

This study provides first-person insight into the importance of collaboration in the experience of leading a 1:1 initiative. The conclusion that collaboration is at the heart of the leadership experience in a 1:1 initiative is consistent with previous research (e.g. Fullan 2014, Greaves et al., 2010; Learning Cultures Consulting, 2006; Rogers, 2003). Participants in this study shared a belief that collaboration was vital to their success, both within the participants' schools and collectively as a pilot for the 1:1 initiative. For example, Dottie described herself as "one of the people at the table, not *the* person at the table." The participants made it a priority to create structures within the school that would enable teacher collaboration. Professional learning was collaborative and collaborative planning time was built into their schedules. Learning walks enabled teachers to see change occurring in their colleagues' classrooms, thereby increasing observability (Rogers, 2013). Brian rearranged classrooms to foster ongoing, natural collaboration. Brian explained, "It was a huge headache for people [to move classrooms], but if your grade level is strewn around the building, then you can't collaborate truly." Collaboration extended beyond the school as well. Consistent with recommendations made by Fullan (2014), Learning Cultures Consulting (2006), and Levin and Schrum (2013), each of the principals identified networks who they felt were a critical part of their experiences leading change. These networks included other principals, Curriculum and Instruction offices, and the Department of Information Technology. They expressed a desire to support a learning community of other principals beginning to implement a 1:1 initiative, showing that, principals who lead a 1:1 initiative aim to be system and district players (Fullan 2014).

Counterpoints and new perspectives. This study addresses the lack of scholarly research on 1:1 program leadership that describes the common experiences of leaders engaged in the change process. Through the use of a discipline specific framework that included leadership responsibilities for second-order change (Marzano et al., 2005) and technology standards for administrators (ISTE, 2009), the research was approached with a broad lens that enabled fresh perspectives on the experience. Of the 28 attributes included on the discipline specific framework, only five emerged as composite themes. It was not expected that all attributes of the framework would be addressed through this research.

Moreover, the results of this study provide new insights related to two themes from previous findings in the fields of 1:1 computing, technology leadership, and change leadership, as well as the ISTE*A Standards (2012). First, previous research on 1:1 computing (Learning Cultures Consulting, 2006; Levin & Schrum, 2013), technology leadership (Afshari et al., 2009; Banoglu, 2011; Chang, 2011; Chang et al., 2008; Eren & Kurt, 2011), and change leadership (ISTE, 2012; Kotter, 2012; Marzano et al., 2005) argued that the principal plays a vital role in vision setting. However, the results of this study do not indicate vision setting as a composite theme. Second, previous research on 1:1 computing (Levin & Schrum, 2012; Greaves et al., 2010) and technology leadership (Eren & Kurt, 2011; ISTE, 2012) identified technology use and modeling as a key leadership responsibility. The findings in this study, however, suggest that this is not a part of the principals' collective experience. The counterpoints and new perspectives offered by this study will be discussed in the following sections.

Discipline Specific Framework. Of the 23 responsibilities and standards in the discipline specific framework that did not emerge as composite themes, four had a moderate presence in the data. Intellectual stimulation; monitoring and evaluating; allocating time, resources, and access to professional growth in technology; and staying abreast of educational research were revealed in the data of five of the eight principals. While some principals believed those attributes to be critical to their experience, others did not have that same perception. Because the focus of this research was on uncovering the commonalities in experience, these themes were not included in the composite results.

The remaining attributes from the discipline specific framework had limited or no presence in the data. For example, the absence of flexibility, ideals/beliefs, and knowledge of curriculum, instruction, and assessment revealed that the principals did not perceive these leadership responsibilities for second-order change as important in their experience. The framework also included attributes related to faculty management, such as recruiting and retaining personnel and improving staff performance using data. These attributes were outside the focus of this study. The setting of the study also influenced the themes that emerged. There was limited evidence in the data of ISTE*A Standard 2.d., ensuring the effective practice in the study of technology. The emphasis of implementation in this setting was the use of technology as a tool for creating student-centered learning environments. Upper-level leadership deemphasized the study of technology in isolation. Other attributes related to providing technology access and infrastructure; in the setting of this study, those responsibilities were managed centrally and were not the responsibility of the principal. Two of the ISTE*A Standards called for engagement at the national level in advocacy and learning communities. Given that this

study focused on the early stages of implementation, it was not unexpected that these attributes did not emerge in the data. By using a discipline specific framework that was broad in scope, new perspectives were gained on principals' perceptions of their experience and the situations that influence those perspectives.

Vision setting. Research on 1:1 computing, technology leadership, and change leadership consistently supports that vision setting is integral to implementation of a new initiative. Levin and Schrum (2013) emphasized that vision must be addressed when planning for a 1:1 initiative, and Learning Cultures Consulting (2006) asserted that goals in 1:1 programs can be achieved when effective leaders communicate a shared vision. Research frequently asserts vision as a technology leadership responsibility (Afshari et al., 2009; Banoglu, 2011; Chang, 2011; Chang et al.,, 2008; Eren & Kurt, 2011). Marzano et al. (2005) and Kotter (2012) also identify vision setting as critical to change leadership. Kotter's (2012) eight step change model includes developing a vision and strategy and communicating the change vision as the third and fourth steps. Vision setting is also prominent in the ISTE*A Standards (2009). Standard 1.a indicates that effective digital age leaders "Inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital-age resources to meet and exceed learning goals, support effective instructional practice, and maximize performance of district and school leaders" (p. 1). When constructing the discipline specific framework for this study, it was determined that this standard reflected the synchrony of technology, pedagogy, and change knowledge, and was therefore aligned to the conceptual framework, Stratosphere. ISTE*A Standard 1.b also emphasizes the role of leader in vision setting, stating that leaders should, "Engage in an ongoing process to develop,

implement, and communicate technology-infused strategic plans aligned with a shared vision" (p. 1).

Despite strong claims in previous research and industry standards, the concept of vision setting did not emerge as a composite theme in this study. This is not to say that building a shared vision was absent from the data. Several principals mentioned vision setting as important to implementation. Ann, for example, explained they had previously started creating a shared vision, and revisited it when they were named a pilot school. Russell shared that he met with multiple stakeholder groups in order to rewrite the school's vision in light of the 1:1 initiative. Lisa used learning walks with her staff to collaboratively determine a vision for what classrooms would look like in the new 1:1 environment, and then shared that vision with parents. Yet, these experiences of creating a shared vision were not common among all principals. Some principals did not speak to vision setting as a part of their role or responsibilities or as a way to promote change. As focus of this research was on the commonalities in experience, vision setting was not included in the composite themes.

These findings provide both a counterpoint and a new perspective in 1:1 computing. Research leads us to believe that vision setting is a critical component in a principals' change leadership experience. This study, however, illustrates that vision setting is not a universal component of the change experience in a 1:1 computing initiative. It is important to contextualize this conclusion in the specific setting of this study: a large school district with a clearly articulated system wide vision and implementation plan for 1:1 computing. Topper and Lancaster (2013) suggested that it was the role of the principal to implement the district's vision for effective technology

use. Thus, this study suggests that with the vision clearly articulated at the system level, the principal focuses less on vision setting at the school level. Relatedly, there was limited evidence in this study of ISTE*A Standard 2.c (2009), which states that effective leaders provide learner-centered environments equipped with technology and learning resources. In this context, schools were equipped with technology and digital resources from the district level. Again, this study suggests that principals focus less on this these aspects of implementation when they are provided for at the system level. With these insights, this study offers a new perspective in 1:1 computing research and technology leadership research regarding how vision setting and technology decision-making at the system level impacts the role and responsibilities of the principal.

Technology use and modeling. Research on 1:1 computing and technology leadership also emphasizes technology use and modeling as integral to program leadership. In the Project Red survey (Greaves et al., 2010), for example, respondents identified modeling technology use as an important responsibility of technology leaders. Eren and Kurt (2011) and Levin and Schrum (2012) supported those findings. The ISTE*A Standards (2009) infuse technology use and modeling throughout the categories of Digital-Age Learning Culture, Excellence in Professional Practice, and Systemic Improvement and Digital Citizenship. The standards indicate that digital age leaders should:

- Model and promote frequent and effective technology use (Standard 2.b)
- Model and promote effective communication and collaboration using technology (Standard 3.c.)
- Use appropriate technology and media resources to lead purposeful

change that maximizes learning goals (Standard 4.a)

- Model safe, legal, and ethical use of digital information and technology (Standard 5.b)

- Model responsible social interactions with technology (Standard 5.c)

- Model cultural understanding and involvement in global issues through the use of digital tools (Standard 5.d)

While research and standards place a heavy emphasis on the principals' interaction with technology, the experience of participants in this study provides a counterpoint. The principals spoke very little of their own interactions with technology. Brian found that while he initially believed that his role was to model technology use, he quickly realized that his role was "more about emotional support." Similarly, Carol indicated that she found she did not have to be the expert in technology. She felt that she had to be the expert in instruction and learn enough about the tools to know if their use was a good instructional choice. None of the principals discussed the modeling and use of technology for promoting digital citizenship.

Although the principals did not view their personal technology use as central to their experience, they did perceive technology use and modeling as important in leading change. This study provides insight into how principals perceived their role and the role of their staff in technology use and modeling in a 1:1 initiative. The principals in this study used a collaborative approach to leadership. Implementation was a "team effort," as Tiffany described it. Assistant principals, staff development teachers, grade level leaders, and literacy coaches all contributed to this team effort. To illustrate, ISTE*A Standard 4.a, the second standard in the discipline specific framework that reflects Stratosphere,

indicates that leaders must use appropriate technology and media resources to lead purposeful change that maximizes learning goals. The principals in this study focused on leading purposeful change that maximizes learning goals, and used both opinion leaders (Rogers, 2003) and a distributed leadership approach (Levin & Schrum, 2013; Peterson, 2014) to promote the use of appropriate technology and media resources. They relied on other building leaders—informal opinion leaders who are able to influence others' behaviors (Rogers, 2003) as well as individuals in more formal leadership roles—to fulfill these needs. For example, Brian referred to his staff development teacher as "the core" of professional learning around technologies and new pedagogies in the building. Carol described "tapping into" the expertise and leadership she saw in her 3rd grade teachers. This study provides new insights into the role of the principal in technology use and modeling, and how they utilize distributed leadership and opinion leaders to create change.

Future Research

Given the limited attention in current research to the role of the principal in leading 1:1 initiatives, and the lack of phenomenological research on the subject, there are many opportunities for future research. There are additional opportunities for research with this population by analyzing the data with regard to demographic trends, such as the principals' years of experience, the principals' gender, or the characteristics of the community. This study should also be replicated with additional principals. This study is limited by its use of convenience sampling. The school district selected the schools who would pilot the initiative, and that selection process included an application demonstrating staff and community buy-in. Therefore, this study should be replicated

with groups of elementary principals who are mandated by their school system to implement 1:1 computing. This will yield insights into whether or not the lived experience in that context is different. This is a critical understanding in order to inform decision-making as the program is implemented beyond the pilot year.

This study should also be replicated with middle school and high school principals. Middle and high schools present a very different context than elementary schools. For example, where elementary school principals are content generalists, secondary principals have a content specialization background, and often rely on department chairs for their content expertise. It has also been my experience and observation that elementary schools are traditionally more collaborative and high schools are more isolationist in their cultures. It is critical that we understand the nuances of the principals' lived experience in these unique settings. Without this understanding, we will continue to make decisions about 1:1 implementation based on assumptions, not sound research.

Research cannot stop at the understanding of shared experiences. We must use this understanding as the foundation for pursuing research that directs the field in planning and providing relevant support and professional development for principals leading 1:1 initiatives. Questions driving this line of research must consider how to replicate what principals perceived as a positive experience leading change. This research must also consider how we can foster in other leaders the attributes and beliefs espoused by the principals in this study. Specifically, we must explore strategies for promoting collaboration and for strengthening skills related to acting as a change agent and instructional leader in a 1:1 initiative. This line of research is imperative in informing the

growth of 1:1 initiatives from pilot to full implementation as school systems aim to develop highly effective principals that can replicate results in a variety of settings.

Finally, next steps must be pursued that will impact the role of technology in education and student learning. This research must ultimately connect with positive student outcomes. The current study provides a description of the shared experience of principals leading a 1:1 computing initiative. It makes no connection with student outcomes, nor does it claim that the composite themes are correlated with a successful implementation. Given that this study took place in the first year of implementation, it was too early to make claims about student outcomes. This research must be revisited when student outcome data is available in order to determine the lived experience of principals leading a successful 1:1 initiative. Again, this should be examined in the varying contexts of elementary, middle, and high schools. Correlating principal leadership and positive student outcomes is critical in ensuring successful implementation.

Conclusion

The body of research on 1:1 computing has continued to increase as the number of programs has risen and programs have received national attention. While there was ample research on program implementation from the teacher and student perspectives prolific (Dunleavy et al., 2007; Lowther et al., 2012; Prettyman et al., 2012; Spires et al., 2011; Storz & Hoffman, 2013), there was little insight into the lived experience of principals leading change in a 1:1 initiative. To date, the experiences and role of the principal had been largely unexplored, and principals frequently were not first-hand participants in the research. When they were included, their voices were combined with

leaders in other roles. Technology leadership and change leadership research both provided useful insights into program leadership and implementation, but it was unknown how findings from that research could be generalized to this specific context. The results of this study fill methodological and conceptual gaps in the research.

This study reflects the experiences of eight principals leading the pilot for a system wide 1:1 initiative in a large Mid-Atlantic school district. Using a phenomenological philosophy and framework, this study built an understanding of these principals' experience. The results of this study were a composite textural description indicating what the collective experience was, a composite structural description indicating the underlying universal leadership structures, and a final synthesis describing the essence of the experience. The composite textural description revealed five themes: 1) prior experiences impacted their leadership; 2) overall feelings about the experience were positive; 3) risk-taking was valued, promoted, and supported; 4) instructional leadership was a key responsibility; and 5) collaboration was valued and fostered. The composite structural description also revealed five themes: 1) fulfilling the responsibility of Optimizer, 2) acting as a Change Agent, 3) ensuring educational innovation in digital age learning, 4) facilitating and participating in learning communities, and 5) establishing and leveraging partnerships. These themes captured two responsibilities for second order change (Marzano et al., 2005) and three of the ISTE*A standards. Collaboration was at the heart of the essence of principals' experience in leading the changes associated with a 1:1 initiative. Collaboration permeated all aspects of the experience, including how they viewed their role and responsibilities, how they promoted change, and how they responded to successes and challenges.

This study is significant for its contribution to the body of scholarship, as it both adds a new perspective to current research on 1:1 computing, and contextualizes current research on technology leadership and change leadership within 1:1 computing. Readers may use the findings of this study as a lens through which to reflect upon their own experiences leading 1:1 initiative. Further, this study provides a foundation for informing decisions regarding program implementation of 1:1 computing. Schools implementing 1:1 initiatives should seek ways to support collaboration and learning communities. This is a critical understanding when expanding from a pilot to full implementation; specific efforts must be taken to build small communities within and among schools. As research on 1:1 computing continues to expand, we must continue to refine these understandings, so that principals' positive impact on the initiatives may be ensured.

APPENDICES

Appendix A: Towson University IRB Approval

TOWSON
UNIVERSITY

EXEMPTION NUMBER: 14-X161

To: William   Sadera

From: Institutional Review Board for the Protection of Human
           Subjects Justin Buckingham, Member

Date: Thursday, June 12, 2014

RE: Application for Approval of Research Involving the Use of
           Human Participants

Office of Sponsored Programs
& Research

Towson University
8000 York Road
Towson, MD 21252-0001

t. 410 704-2236
f. 410 704-4494
www.towson.edu/ospr

Thank you for submitting an application for approval of the research titled,

[Title Redacted]

to the Institutional Review Board for the Protection of Human Participants
(IRB) at Towson University.

Your research is exempt from general Human Participants requirements
according to 45 CFR 46.101(b)(2). No further review of this project is
required from year to year provided it does not deviate from the submitted
research design.

If you substantially change your research project or your survey
instrument, please notify the Board immediately.

We wish you every success in your research project.

CC: S. Pautz, E. Berquist
      File

Appendix B: Letter of Intent

April 29, 2014

As part of a collaboration between [this school system] and Towson University's College of Education, several research and evaluation projects are being pursued focusing on [this school system's] 1:1 digital conversion project. It is essential to the success of this endeavor to build an understanding of the implementation and impact of this work both for the future of [this school system] and the field of instructional technology as a whole.

The purpose of this specific research endeavor will be to build an understanding of principals' experience in leading the changes associated with a 1:1 initiative and the contexts or situations that influence those experiences. Knowledge about the [piloting] principals' experience is important to [this school system and the 1:1 initiative] for informing the professional development needs of leaders as the initiative is implemented throughout the district in the following years. This phenomenological research will also make a contribution to the field by providing the voice and perspectives of principals as they are experiencing this change, a perspective that is lacking in the current research on 1:1 computing initiatives.

Primary data for this study will be collected from journals and blogs that principals will maintain. Additional data may be collected through interviews. Data collection will begin in May 2014, and continue through the 2014-15 academic year.

Your participation in this research is voluntary, but critical. You have the right to stop participation at any time or choose not to respond to a survey item or interview question. Your decision to participate or not participate in this study will have no effect on your employment status at [this school system].

Be assured that all data for this study will be handled with strict confidence. No individual will be identified in any reports. Your responses will be kept confidential; only the principal investigator and the research team at Towson University will have access to your specific data. All data reports or publications of this research will make use of pseudonyms to further ensure your anonymity.

If you have any questions about this research, you may contact the Principal Investigators, Dr. William Sadera at (410) 704-2731 or Stefani Pautz at (410) 887-4601 or the Chairperson of Towson University's Institutional Review Board for the Protection of Human Participants, Dr. Debi Gartland, at (410) 704-2236.

We thank you for your time and willingness to participate and will be glad to furnish you with additional information and results if you are interested.

Respectfully,

Stefani Pautz
Doctoral Student
Towson University

William A. Sadera
Professor
College of Education
Towson University

Appendix C: Journal Prompts

April 29, 2014

Dear [Piloting] Principals,

Thank you for your participation in this research collaboration between [this school system] and Towson University. For this research, you are asked to participate in journaling and blogging activities designed to allow you to reflect on your experiences as a leader in [the 1:1 initiative]. This letter provides important details for your participation.

Purpose
The purpose of this research is to build an understanding of principals' experiences in leading a 1:1 initiative, including the contexts and situations that influence that experience.

Private vs. Public Spaces
As a part of your experience as a [piloting] principal, both private and public spaces have been created for your use. First, a private PBWorks site has been created for the journaling activity. The journal you will keep will be private, viewable only by the researchers. The journal is private so that you can feel comfortable sharing your thoughts honestly. Data for the research will come primarily from these journals. In the study's findings, pseudonyms will be used for principal and school names to maintain confidentiality. Only the researchers will have access to the data and the corresponding participants' information.

As an extension of the journal, the PBWorks site also contains a group blog, viewable only to other [piloting] principals. One journal entry each month will be selected by the researcher and added to this group blog. *Only with your expressed consent will a journal be shared with the other* [piloting] *principals (See Privacy Protocols for Journals noted below).* Journals may be selected, for example, because they represent a common theme, a noteworthy problem, or a potentially useful solution. On that group page, you are encouraged to interact with one another by providing thoughts, comments, and feedback. This blogging activity provides a forum for collaboration and an opportunity to build community.

Additionally, many of you have school or personal Twitter accounts that you may wish to use to share information about [the 1:1 initiative] in your school. The [1:1 initiative] website also contains a public space where you may post reflections for visitors to read so that they may better understand the experience of implementing a 1:1 initiative and the related activities going on at your school. These public spaces will serve an important role in spreading the word about your school and [the 1:1 initiative] in a public forum, but they will not be a part of this research.

Frequency and Posting of Journals
Each month, you will submit one journal entry. You may wish to jot your thoughts down throughout the month, but your journal will be entered as one submission. This may be adjusted as the research project progresses.

Please post your journal by the last day of each month. (e.g. the first journal is due May 31st, reflecting on the month of May). Journals will be posted to [website address]. When you log into the site, you will see a welcome page, the group blog, and your private journal page. Remember, your journal, which is titled with your name, is your private page. Only you and the researchers can see what you write there. Be sure that you are posting your private journal entries to your private page.

Content of Journals
In each journal, please reflect on your experiences leading [the 1:1 initiative] in your building, including any contexts or situations that you believe are influencing your experience. When you reflect, consider all aspects of [the 1:1 initiative], including pedagogy, technology, and change. Use the following definitions as a guide:

- PEDAGOGY: The art and science of teaching. Key concepts: opportunities to learn differently, learning how to learn, constructivism, learner-centered environments.
- TECHNOLOGY: The use of digital content and digital tools to enhance learning. Key concepts: expanding storehouses of information, ubiquitous access, tools for collaboration.
- CHANGE: The process through which innovations are adopted and schools are recultured. Key concepts: initiation, implementation, institutionalization, cognitive and affective change

Throughout this experience, you may find that a particular topic features more prominently in one month than in another. We encourage you to carefully consider each topic for reflection, but also understand that some months you may write more or less about a given topic.

In addition to these specific topics, you are also welcome to include a section in your journal titled "General Reflections." This provides a space for reflections that you do not associate with one of the three journal prompts, but that you feel are important to the research.

Privacy Protocols for Journals
All journals will be kept private unless you grant permission to share your journal. To indicate that a journal entry may be shared in the group blog, please begin your journal entry with the comment "FOR GROUP BLOG."

Your voice is critical to the success of [the 1:1 initiative]. I look forward to collaborating with you in this research. Thank you again for your participation.

Sincerely,

Stefani Pautz
Doctoral Student
Towson University

William A. Sadera
Professor, College of Education
Towson University

Appendix D: Interview Protocol

Interview Protocol

Opening Statement: Thank you for participating in research and in this interview. The goal of this interview is to gain deeper insight into your experience leading a 1:1 initiative. The results of this study may be used to inform decisions about 1:1 program implementation and the adoption of 1:1 technologies in public schools and to guide program leaders in planning and providing relevant support and professional development for principals.

This interview will be recorded in order for me to transcribe our conversation at another time. Recording will also ensure that I am able to accurately represent your thoughts and ideas. Please know that they are no correct or incorrect answers. I am simply trying to understand your experience. I also understand that many leaders find it challenging to talk about themselves. Research tells us that good leaders focus on their staff, not themselves. For this research, it is important to focus on your own personal experience, thoughts, and feelings.

If at anytime you feel uncomfortable, please let me know, and we can move on to the next question or end the interview. Please take a moment to review and sign this consent statement.

Are you ready to proceed?

General Interview Guide (modified from Moustakas, 1994; Perry, 2013)

1. Tell me about your experience leading the 1:1 program. (Immediate Context-Experiencing)

2. Tell me about your feelings during this experience. (Immediate Context-Experiencing)

3. How do you perceive your role as a principal leading this program? (Immediate Context-Experiencing)

4. What incidents connected with the experience stand out for you? (Immediate Context-Experiencing)

5. What people connected with the experience stand out for you? (Immediate Context-Experiencing)

6. What questions or concerns came to your mind during the experience and how did you go about addressing them? (Immediate Context-Understanding)
   a. When you reached an answer or conclusion, what helped you confirm your thoughts? (Immediate Context-Judging)

7. Did you experience any resistance and if so, how did you respond to it?

8. As a part of the implementation of the 1:1 program, you met monthly with the other [piloting] principals. Did this impact your experience leading the changes in your own building? How so? (Situational Context)

9. Have there been other experiences in your life that influenced how you've led the 1:1 program? (Developmental Context)

10. The ISTE A standards state that the principal should "*Inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital-age resources to meet and exceed learning goals, support effective instructional practice, and maximize performance of district and school leaders.*" Can you comment on this standard in light of your experience? Do you see your experience as reflective of this statement?

11. The ISTE A standards also state that the principal should "*Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources.*" Can you comment on this standard in light of your experience? Do you see your experience as reflective of this statement?

12. How did the experience of leading a 1:1 program affect you?
    a. What personal and/or professional changes do you associate with the experience? (Developmental Context)
    b. Have you decided to take any personal action as a result of this experience? (Immediate Context-Deciding)

13. Through your journals and this interview, have you shared all that is significant with reference to your experience leading this 1:1 initiative?

Potential prompt-starters (modified from Merriam, 2009):
- What factors do you think influenced that thought/feeling/experience?
- In your journal, you wrote about… Tell me more about…
- Tell me about a time when…
- Give me an example of …
- Tell me more about…
- What was it like for you when…
- How did you feel when…

Appendix E: Participant Researcher Statement

Participant Researcher Statement

In qualitative research, the researcher is the primary instrument in data collection and analysis (Creswell, 2013; Merriam, 2009; Moustakas, 1994). As such, it is important to disclose my biases and preconceptions. My professional experiences impact my beliefs about effective program leadership and my interpretation of the data. I currently serve as the Coordinator of Curriculum Development for the school district in which this research was conducted. In this role, I am a part of the team that is leading the curriculum conversion and related policy conversions as the 1:1 initiative is implemented. I have been very involved in developing our learning management system and in the professional development around the changes related to 1:1 computing and creating student–centered learning environments.

I also served in leadership roles prior to my current position. I was the Director of the Eastern Shore Writing Project at Salisbury University. In that position, I lead the organization through changes caused by the reduction of federal funding, collaborating with outside organizations to develop innovative programming and maintain high levels of membership and professional learning activity. Prior to that, I was a high school Literacy and Professional Development Coach. I led data discussions, provided professional development, and formed the school's first Literacy Leadership Team. I began my career as a high school English Teacher. As a teacher, I served on the Instructional Leadership Team, acting as chair of the Reading Committee and Smaller Learning Communities Committees.

My educational experiences also impact my beliefs about leadership. After earning my MA in Composition and Rhetoric and serving in several teacher-leadership

roles, I earned my Administrator I certification. I was selected for the Academy for Leadership in Education at Salisbury University, where I developed a greater understanding of the roles and responsibilities of leaders, with a focus on the development of Professional Learning Communities.

Because of these professional and educational experiences, I have the following beliefs about change and effective program leadership: I believe that change is a process. Effective leaders are able to articulate the vision for change, generate stakeholder buy-in, and maintain motivation during the change process. To lead change, I believe that effective leaders create cultures of collaboration and collegiality around professional learning. I also believe that not all effective leaders are effective change agents. Some leaders may be effective managers, and may provide strong instructional leadership, but may lack the courage to challenge the status quo. I believe that building level leaders should support district initiatives and strive to implement those initiatives with fidelity.

I recognize these biases and preconceptions, and set them aside so as to view the data with fresh eyes. I enter the study ready to gain a fresh perspective and see how change leadership is actually experienced in the context of 1:1 computing initiatives.

Appendix F: List of Researcher Preconceptions

List of Researcher Preconceptions

The researcher will use the following list of preconceptions during reflective-meditation, which Moustakas (1994) recommends as a process for Epoche. This list will be reviewed until the researcher feels an internal sense of closure and a readiness to suspend the preconceptions.

- The implementation of 1:1 computing will positively impact students.

- Effective 1:1 computing initiatives lead with student-centered pedagogy and integrate technology into curriculum.

- The principal is the instructional leader in the building, and should have knowledge of curriculum, instruction, and assessment.

- Change is a process that includes phases of initiation, implementation, and institutionalization.

- The implementation of 1:1 computing is a second-order change.

- Leadership has a significant impact on program success.

- Effective leaders are able to articulate the vision for change, generate stakeholder buy-in, and maintain motivation during the challenging change process.

- Not all effective leaders are effective change agents.

- To be change agents, leaders must have the courage to challenge the status quo.

- Professional development has a significant impact on program success.

- Effective leaders create cultures of collaboration and collegiality around professional learning.

- The principal should support district initiatives and strive to implement the program with fidelity.

Appendix G: Discipline Specific Framework

Matrix of Responsibilities and Standards Aligned within Stratosphere

The following definitions are used in classifying responsibilities and standards within the stratosphere framework:

PEDAGOGY: The art and science of teaching. Key concepts: opportunities to learn differently, learning how to learn, constructivism, learner-centered environments.

TECHNOLOGY: The use of digital content and digital tools to enhance learning. Key concepts: expanding storehouses of information, ubiquitous access, tools for collaboration.

CHANGE: The process through which innovations are adopted and schools are recultured. Key concepts: initiation, implementation, institutionalization, cognitive and affective change

*Where applicable, responsibilities or indicators reflecting *stratosphere* have been additionally notated with *italic* print.

	Pedagogy	Technology	Change
Leadership Responsibilities for Second-Order Change (Marzano, Waters & McNulty, 2005)			
Knowledge of Curriculum, Instruction, and Assessment: Is knowledgeable about current curriculum, instruction, and assessment practices (p.43)	X		
Optimizer: Inspires and leads new and challenging innovations (p.43)			X
Intellectual Stimulation: Ensures faculty and staff are aware of the most current theories and practices and makes the discussion of these a regular aspect of the school's culture (p.42)			X
Change Agent: Is willing to and actively challenges the status quo (p.42)			X
Monitoring/Evaluating: Monitors the effectiveness of school practices and their impact on student learning (p.43)	X		
Flexibility: Adapts his or her leadership behavior to the needs of the current situation and is comfortable with dissent (p.42)			X
Ideals/Beliefs: Communicates and operates from strong ideals and beliefs about schooling (p.42)			X
ISTE Standards Administrators (2009)			
1.a: Inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital-age resources to meet and exceed learning goals, support effective instructional practice, and maximize performance of district and school leaders	X	X	X
1.b: Engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans aligned with a shared vision		X	X
1.c: Advocate on local, state and national levels for policies, programs, and funding to support implementation of a technology-infused vision and strategic plan			X
2.a: Ensure instructional innovation focused on continuous improvement of digital-age learning	X	X	

2.b: Model and promote the frequent and effective use of technology for learning	X	X	
2.c: Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners	X	X	
2.d: Ensure effective practice in the study of technology an its infusion across the curriculum	X	X	
2.e: Promote and participate in local, national, and global learning communities that stimulate innovation, creativity, and digital age learning culture		X	X
3.a: Allocate time, resources, and access to ensure ongoing professional growth in technology fluency and integration		X	X
3.b: Facilitate and participate in learning communities that stimulate, nurture and support administrators, faculty, and staff in the study and use of technology		X	X
3.c: Promote and model effective communication and collaboration among stakeholders using digital age tools		X	X
3.d: Stay abreast of educational research and emerging trends regarding effective use of technology and encourage evaluation of new technologies for their potential to improve student learning		X	X
4.a: Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources	X	X	X
4.b: Collaborate to establish metrics, collect and analyze data, interpret results, and share findings to improve staff performance and student learning		X	X
4.c: Recruit and retain highly competent personnel who use technology creatively and proficiently to advance academic and operational goals		X	X
4.d: Establish and leverage strategic partnerships to support systemic improvement			X
4.e: Establish and maintain a robust infrastructure for technology including integrated, interoperable technology systems to support management, operations, teaching, and learning		X	
5.a: Ensure equitable access to appropriate digital tools and resources to meet the needs of all learners		X	
5.b: Promote, model and establish policies for safe, legal, and ethical use of digital information and technology		X	X
5.c: Promote and model responsible social interactions related to the use of technology and information		X	
5.d: Model and facilitate the development of a shared cultural understanding and involvement in global issues through the use of contemporary communication and collaboration tools		X	X

Appendix H: Structural Themes Analysis Tables

Individual Structural Themes

Ann	Lisa	Tiffany	Dottie	Brian	Russell	Carol	Gerald
Learning as a Priority	**Motivating Teachers**	**Learning as a Priority**	**Learning as a Priority**	**Challenge of Change**	**Motivating Teachers**	**Instructional Leadership**	**Collective Mentality**
Intellectual stimulation, 3d, 3a, 3b,	Optimizer, flexibility,	Intellectual stimulation, 3a, 3d	Intellectual stimulation, Change agent, 3a, 3d, 4d	Change Agent	Optimizer	Knowl of CIA, Monitor/Eval	3b, 4d
Motivating Teachers	**Changing Instruction**	**Changing Instruction**	**Collective Mentality**	**Changing Instruction**	**Changing Instruction**	**Changing Instruction**	**Changing Instruction**
Optimizer, flexibility, 4c	Change agent, 1a, 2a	Change agent, 1a, 3b, 2d	2e, 3b	2.a, 2.b, Monitor/Eval, 5.a	Change Agent, 2c, 1a, Monitor/Eval	Optimizer, Change Agent, 2a, Monitor/Eval	Monitor/Eval, 2a, knowl of CIA, 2b
Changing Instruction	**Professional Learning**	**Instructional Leadership**	**Motivating Teachers**	**Motivating Teachers**	**Collaboration**	**Collaboration**	**Motivating Teachers**
Change agent, 1a	Intellectual stimulation,	Knowl of CIA, 3c, 2a, 3b, 4d	Optimizer, 2a	Optimizer, Flexibility	3b, 2a, 1c, 4d	3a, 3b, 4d, 2a	Change Agent, Optimizer
Collective Mentality	**Responding to Challenges**	**Motivating Teachers**	**Advocating for 1:1 Computing**	**Collaboration**	**Personal Learning**	**Learning as a Priority**	**Professional Learning**
3b, 4d, 5d, 2a	5a, Knowl of CIA, Monitor/Eval, 4d	Optimizer	1c, 4a	3b	Knowl of CIA, 3d, Ideals/Beliefs	Intellectual Stimulation, 3d	3d, Intellectual stimulation
	Advocating for 1:1 Computing						
	1c						

Note: While a particular code may appear consistently across all participants, it may manifest itself differently in their experience. Description of codes can be found in the Discipline Specific Framework (Appendix G).

Composite Structural Themes

Ann	Lisa	Tiffany	Dottie	Brian	Russell	Carol	Gerald
Optimizer	Optimizer	Optimizer	Optimizer	Optimizer	Optimizer	Optimizer	Optimizer
Flexibility	Flexibility			Flexibility			
Intellectual Stimulation		Intellectual stimulation	Intellectual Stimulation		Intellectual Stimulation	Intellectual Stimulation	
Change agent	Change Agent	Change Agent	Change Agent	Change Agent	Change Agent	Change Agent	Change Agent
	Monitor/Evaluate			Monitor/ Evaluate	Monitor/ Evaluate	Monitor/ Evaluate	Monitor/ Evaluate
	Knowledge of Curriculum, Instruction, & Assessment	Knowledge of Curriculum, Instruction, & Assessment			Knowledge of Curriculum, Instruction, & Assessment	Knowledge of Curriculum, Instruction, & Assessment	Knowledge of Curriculum, Instruction, & Assessment
					Ideals/Beliefs		
1.a	1a	1a	1a		1a		
	1c				1c		
2a	2a	2a	2a	2a	2a	2a	2a
		2b					2b
					2c		
		2d					
			2e				
3.a	3a	3a	3a			3a	
3.b	3b	3b	3b	3b	3b	3b	3b
		3c					
3.d		3d	3d		3d	3d	
4c							
4d	4d	4d	4d		4d	4d	4d
5a	5a			5a			

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PROFESSIONAL PUBLICATIONS:

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PROFESSIONAL POSITIONS HELD:

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Literacy/Professional Development Coach	2009-2011	Dorchester County Public Schools Cambridge, MD
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Adjunct Instructor	2015-present	Goucher College Towson, MD